

Additions to Neotropical species of the genera *Lithocharodes* Sharp, 1881 and *Somoleptus* Sharp, 1881 (Coleoptera, Staphylinidae)

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Abstract

Amongst the material of the Kansas Natural History Museum, ten new species of the genus *Lithocharodes* Sharp, 1876 and eight new species of the genus *Somoleptus* Sharp, 1885 were found for the Neotropical Region. These are: *Lithocharodes andersoni* sp. nov., *L. dubia* sp. nov., *L. esmeraldae* sp. nov., *L. falini* sp. nov., *L. hansonii* sp. nov., *L. hibbsi* sp. nov., *L. lituratus* sp. nov., *L. montanus* sp. nov., *L. parallelus* sp. nov. and *L. zamorae* sp. nov. and from the genus *Somoleptus*, the species *S. alajuelae* sp. nov., *S. curtioculatus* sp. nov., *S. densiceps* sp. nov., *S. guianensis* sp. nov., *S. luteicornis* sp. nov., *S. paramocola* sp. nov., *S. puntarenas* sp. nov. and *S. umicola* sp. nov. New records were found for *Lithocharodes bicolor* (Sharp, 1885), *L. curtipennis* Irmeler, 2021, *L. puncticeps* Sharp, 1885, *L. somoleptoides* Irmeler, 2021, *Somoleptus ashei* Irmeler, 2022, *S. humicola* Irmeler, 2022, *S. longicollis* (LeConte, 1863), *S. obscurus* Sharp, 1885 and *S. ovatus* Irmeler, 2022.

Zusammenfassung

Im Material des Kansas Natural History Museum wurden 10 neue Arten der Gattung *Lithocharodes* Sharp, 1876 und 8 neue Arten der Gattung *Somoleptus* Sharp, 1885 aus der neotropischen Region gefunden. Dies sind: *Lithocharodes andersoni* sp. nov., *L. dubia* sp. nov., *L. esmeraldae* sp. nov., *L. falini* sp. nov., *L. hansonii* sp. nov., *L. hibbsi* sp. nov., *L. lituratus* sp. nov., *L. montanus* sp. nov., *L. parallelus* sp. nov., *L. zamorae* sp. nov. und aus der Gattung *Somoleptus* die Arten *S. alajuelae* sp. nov., *S. curtioculatus* sp. nov., *S. densiceps* sp. nov., *S. guianensis* sp. nov., *S. luteicornis* sp. nov., *S. paramocola* sp. nov., *S. puntarenas* sp. nov. und *S. umicola* sp. nov. Zusätzlich liegen neue Nachweise von *Lithocharodes bicolor* (Sharp, 1885), *L. curtipennis* Irmeler, 2021, *L. puncticeps* Sharp, 1885, *L. somoleptoides* Irmeler, 2021, *Somoleptus ashei* Irmeler, 2022, *S. humicola* Irmeler, 2022, *S. longicollis* (LeConte, 1863), *S. obscurus* Sharp, 1885 und *S. ovatus* Irmeler, 2022 aus der neotropischen Region vor.

Key Words

Lithocharodes, Neotropics, new records, new species, *Somoleptus*, Xantholinini

Schlüsselwörter

Lithocharodes, Neotropis, neue Arten, neue Nachweise, *Somoleptus*, Xantholinini

Introduction

Amongst the material of specimens from the genera *Lithocharodes* Sharp, 1876 and *Somoleptus* Sharp, 1885 of the Kansas Natural History Museum, Lawrence, Kansas, USA, used for the study of the genera (Irmeler 2021, 2022), two boxes with specimens have been left. The two boxes have been excluded from the former study because the identification of the genus was too difficult. Originally, the specimens were identified as *Somoleptus*, which, however, was not correct, if the aedeagus characters are considered as proposed by Irmeler (2021). There are still a lot of specimens only present as females that cannot be finally identified as *Somoleptus* or *Lithocharodes*. Finally, several specimens were identified in 18 new species in total: ten species of the genus *Lithocharodes* and eight species of the genus *Somoleptus*. Several of them are only present in one specimen. The present study describes the new species and adds several records of species already noted in the two former studies of Irmeler (2021, 2022). Furthermore, the taxonomic problems are discussed and zoogeographic and ecological remarks are made.

Material and methods

The material studied in this investigation is presently deposited in the following public museums and private collections:

KNHM	University of Kansas, Museum of Natural History, Lawrence, Kansas, U.S.A.
SDEI	Senckenberg, Deutsches Entomologisches Institut, Müncheberg, Germany
UIC	Collection of author, Plön, Germany, being part of SDEI

The photographs were taken using a Stereomicroscope Olympus SZX7 with the digital camera LC 30. CombineZ5 (Hadley 2006) was used to optimise depth of focus. Length was measured in the middle of tagmata: head from clypeus to posterior edge, pronotum from anterior to posterior edge along mid-line, elytra from anterior edge of humeral angles to posterior edge; width at the widest part of tagmata (head width includes eyes). In the measurement of total length, the abdominal inter-segmental space is subtracted. The following ratios were used in the descriptions: Eye length versus length of posterior sides of head (PS:E); length of cones versus length of central lobe (C:A) (see Irmeler (2022)).

Results

Description of species

Lithocharodes andersoni sp. nov.

<https://zoobank.org/8583C739-19A7-4D4A-82D0-B530D880FD4A>
Figs 1a–d, 19A

Material examined. *Holotype*: COSTA RICA male; Guanacaste; Pitilla Biological Station; 600 m elevation;

10°58'0"N, 85°25'0"W; Berlese; leaf litter, 2 May 1995; R. Anderson leg.; KNHM CR1A95 4B.

Paratypes: COSTA RICA 1 male; 3 females; same data as holotype KNHM CR1A95 4B and 4D; 1 male; same data; UIC CR1A944B; PANAMA 1 male; Cerro Campana (Capira); 790 m elevation, 8°44'N, 79°57'W; flight intercept trap; 5 June 1995; J. Ashe, R. Brooks leg.; KNHM #129; 1 male; Darién, Estacion Ambiental Cana; Cerro Pirre; 7°45'20"N, 77°41'6"W; 1300 m elevation; cloud forest transition litter, 6 VI 1996, R. Anderson leg.; KNHM #96-113B; 1 male; Colon, Parque Nac. Soberania; Pipeline Rd.; 9°07'N, 79°45'W; flt. intercept trap; 27 May 1995; J. Jolly, C. Chaboo leg.; KNHM; 1 male; 1 female; same location; Pipeline Road km 5.3; flight intercept trap; 31 May–2 June 1995; J. Ashe, R. Brooks leg.; KNHM #098.

Diagnosis. According to the structure of the aedeagus with absent sclerotised endophallus, the species is most similar to the *L. hanagarthi*-group that is characterised by a short transparent endophallus. In contrast to the bicoloured other two species of the group, *L. andersoni* is unicoloured as *L. boliviana* Irmeler, 2021 and not bicoloured as *L. hanagarthi* Irmeler 2021. It differs from *L. boliviana* by the much sparser punctuation of the head.

Description. Length: 5.3 mm; Colouration: blackish, legs light brown yellowish, antennae darker light brown.

Head: 0.82 mm long, 0.67 mm wide; eyes not prominent; PS:E ratio 3.73; postocular sides smoothly curved to rounded posterior angles; without distinct posterior angles; interantennal furrows reaching anterior edge of eyes; centrally between eyes with indistinct depression; setiferous punctuation scarce and moderately deep; distance between punctures irregular; on average, two to three times as wide as diameter of punctures; without microsculpture; surface polished; antennae with first antennomere as long as half-length of head; second and third antennomere conical; combined half as long as half-length of first antennomere; following antennomeres transverse; on average, twice as wide as long; slightly increasing in width; all antennomeres pubescent. Pronotum: 1.04 mm long, 0.63 mm wide; only slightly wider in anterior third; widest part at anterior third; slightly narrowed to posterior angles; posterior angles obtuse; posterior edge smoothly rounded; setiferous punctuation moderately deep and dense; along impunctate mid-line with irregular row of 10–15 punctures; on average, interstices between punctures irregular; at least as wide as diameter of punctures; surface without microsculpture; polished. Elytra: 0.95 mm long, 0.85 mm wide; humeral angles obtuse; sides posteriorly slightly divergent; posterior angles sub-rectangular; posterior margin slightly retreated to suture; setiferous punctuation dense and moderately deep; on average, interstices between punctures as wide as diameter of punctures; surface without microsculpture; polished. Abdomen finely and moderately densely punctate; surface without microsculpture; polished; sternite VII of male with straight posterior margin; slightly emarginate at outer angles; tergite VII of male straight. Meso- and meta-tibia with four ctenidia. Aedeagus widest near anterior edge; anterior edge straight; slightly convergent

posteriorly; without distinct endophallus; parameres thick; longer than half-length of central lobe; C:A ratio 0.5; slightly narrowed anteriorly; in anterior third abruptly narrowed; along inner edge and in anterior half with numerous sensillae.

Etymology. The species name honours the collector of the species Richard Anderson, who sampled Staphylinidae extensively in the Neotropical Region.

Geography. Costa Rica and Panama.

Ecology. Floor of montane forests and lower cloud forests in May and June.

***Lithocharodes dubia* sp. nov.**

<https://zoobank.org/7A616F9F-4F34-40FE-820D-00CC23B6D61A>

Figs 2a–d, 19B

Material examined. Holotype: COSTA RICA male; Puntarenas; Osa Peninsula; 4 km W Rancho Quemado; 8°41'36"N, 83°35'33"W; ridge forest litter; 500 m elevation; 24 VI 2001; R. Anderson leg.; KNHM CR1A01 121

Paratypes: COSTA RICA; 1 female; Guanacaste; Pitilla Biological Station; 10°58'0"N, 85°25'0"W; 600 m elevation; Berlese leaf litter; 2 May 1995; R. Anderson leg.; KNHM CR1A95 4B.

Diagnosis. According to the small dorsal plate of the aedeagus, *L. dubia* must be grouped to the *L. obscura*-subgroup. In contrast to both other species of the subgroup, *L. obscura* and *L. hansonii*, *L. dubia* has no concavely emarginate posterior margin of the head. The sclerotised edges of the orifice are similar as in *L. hansonii*. In the overall habitus, *L. dubia* resembles *L. nigerrima* Irmeler, 2021 in size, colouration, proportion of the elytra and punctuation. As the dorsal plate of the aedeagus is difficult to recognise, the taxonomic situation of the species is not clear.

Description. Length: 4.3 mm; Colouration: black; abdominal tergites II–IV slightly lighter, brown; legs yellow-brown; antennae brown.

Head: 0.75 mm long, 0.61 mm wide; eyes moderately large, not prominent; PS:E ratio 3.6; postocular sides nearly parallel; in posterior half semi-circular; interantennal furrows short; setiferous punctuation moderately deep and dense; on average, interstices between punctures at least as wide as diameter of punctures; partly wider; surface without microsculpture, polished; antennae with first antennomere elongate; approximately two thirds as long as head; second and third antennomere conical; longer than wide; combined half as long as first antennomere; following antennomeres wider than long; apically increasing in width. Pronotum: 0.87 mm long, 0.53 mm wide; widest in anterior third; 1.2 times as wide as in front of posterior angles; anterior angles widely convex; narrowed to neck; behind middle, abruptly narrower than in front; posterior sides nearly parallel; posterior angles sub-rectangular; posterior margin slightly convex; setiferous punctuation deeper and denser than on head; on average, interstices between punctures half as wide as diameter of punctures; laterally partly sparser; wide mid-line impunctate; surface

without microsculpture; polished. Elytra: 0.69 mm long, 0.66 mm wide; humeral angles obtuse; sides nearly parallel; posterior angles sub-rectangular; posterior margin retreated to suture; setiferous punctuation deeper and denser than on pronotum; on average, interstices between punctures half as wide as diameter of punctures; partly denser; surface without microsculpture; polished. Abdomen with setiferous punctuation finer and slightly sparser than on fore-body; surface without microsculpture; polished; sternite VII of male at posterior margin slightly convex with short central emargination; tergite VII of male at posterior margin nearly straight; meso-tibia with 5, meta-tibia with 2 ctenidia. Aedeagus widest in posterior half, in middle, abruptly narrowed to apex; apical part still narrower; long orifice with sclerotised inner edges; endophallus covered by moderately large spines; parameres long; bilobed; inner lobe three fourths as long as central lobe; elongate; slender; straight at base; from middle to apex curved; in basal part, three short setae; in central part with few sensillae; outer lobe transparent; half as long as inner lobe.

Etymology. The species name derived from the same Latin word and means doubtful. It refers to the doubtful taxonomic situation of the species due to the hardly recognisable size of the aedeagal dorsal plate.

Geography. Costa Rica.

Ecology. Montane forest litter in May and June.

***Lithocharodes esmeraldae* sp. nov.**

<https://zoobank.org/ECD64963-83BB-4CF7-A052-612684091CBF>

Figs 3a–d, 19C

Material examined. Holotype: ECUADOR male; Esmeraldas, Bilsa; 0°20'0"S, 79°43'0"W; flight intercept trap; 28 Apr–10 May 1996; P. Hipps leg. KNHM ECU1H96 015.

Paratypes: ECUADOR 1 female; same location as holotype; 5 Jun–7 Jul 1996; KNHM ECU1H96 014; 1 female; Pichincha; Maquipucuna Biological Station; 0°6'25"N, 78°37'18"W; montane evergreen forest litter; 27 Oct 1999; R. Anderson; KNHM ECU199 209C.

Diagnosis. The structure of the aedeagus fits with the characters of the *L. fusciventris*-group, regarding the shape of the elongate central lobe and minute teeth of the endophallus. At present, six species belong to the group. Amongst the group, *L. esmeraldae* resembles *L. nigerrima* Irmeler, 2021 most closely concerning the black colouration and density of punctuation. It differs from *L. nigerrima* by the shorter eyes. In *L. esmeraldae*, postocular sides are nearly 4 times as long as eyes, whereas in *L. nigerrima*, postocular sides are only twice as long as eyes. *Lithocharodes fusciventris* Sharp, 1885 is also darkly coloured, but the colouration is brownish and not blackish and the punctuation of the head is denser. The other species of the group are either bicolored or have short elytra.

Description. Length: 5.8 mm; Colouration: unicoloured black; humeral angles yellowish; legs and antennae light brown.

Head: 0.95 mm long, 0.69 mm wide; eyes short; PS:E ratio 4.1; postocular sides approximately parallel; posterior angles absent; semi-circular; widely rounded to neck; between eyes with indistinct depression; setiferous punctation fine; moderately sparse; on average, interstices between punctures at least twice as wide as diameter of punctures; surface without microsculpture; polished; antennae with first antennomere elongate; more than half as long as head; second and third antennomere conical; each twice as long as wide; following antennomeres transverse; on average, twice as wide as long, apically increasing in width. Pronotum: 1.20 mm long, 0.69 mm wide; widest at anterior third; posteriorly, sides approximately parallel; without distinct posterior angles; posterior margin smoothly convex; setiferous punctation irregularly dense; denser and deeper than on head; on average, interstices between punctures as wide as diameter of punctures or slightly wider; in anterior two thirds with wide impunctate mid-line; surface without microsculpture; polished. Elytra: 1.01 mm long, 0.91 mm wide; humeral angles obtuse; posteriorly slightly divergent; posterior angles sub-rectangular; posterior margin slightly retreated to suture; setiferous punctation as dense as, but deeper than on pronotum; on average, interstices between punctures not wider than diameter of punctures; surface without microsculpture; polished. Abdomen with fine setiferous punctation; surface without microsculpture; polished; sternite VII of male at posterior margin with prominent central part; on each side of prominence with concave emargination; tergite VII of male slightly sinuate; with slightly prominent central part. Meso- and meta-tibia with 4 ctenidia each. Aedeagus oval; apically sinuate; endophallus elongate with few torsions at base and at apex; covered by minute teeth; paramere only one third as long as central lobe; smoothly curved; nearly semi-circular; from wide base continuously narrowed to apex; narrow; inner edge with row of setae; setae longest at base; in anterior half setae much shorter.

Etymology. The species name derived from the province Esmeralda in Ecuador, where it was collected.

Geography. Western Ecuador.

Ecology. Montane forest floor from April to October.

***Lithocharodes falini* sp. nov.**

<https://zoobank.org/BF3EF244-6444-47F8-831C-5C86E7DFEF69>

Figs 4a–d, 19D

Material examined. Holotype: SURINAME male; Marowijne Palumeu; 3°20'56"N, 55°26'18"W: ca. 160 m elevation; flight intercept trap; 7–8 July 1999; Z. Falin leg., KNHM #SUR1F99 183.

Diagnosis. The species resembles *L. andersoni* sp. nov. and may be the sister species of it in the Guyana region. It certainly belongs also to the *L. hanagarthi* sub-group. *L. falini* differs from *L. andersoni* by the proportion of the head. The head of *L. falini* is slightly shorter than in *L. andersoni* and, thus, the postocular sides are also shorter

(PS:E ratio in *L. falini* 3.06 and in *L. andersoni* 3.73). In contrast, the parameres in *L. falini* are longer with C:A ratio 0.66 than in *L. andersoni* with C:A ratio 0.52.

Description. Length: 4.26 mm; Colouration: completely black; legs and antennae lighter brown to yellowish-brown.

Head: 0.73 mm long, 0.61 mm wide; eyes slightly prominent; moderately large; PS:E ratio 3.7; postocular sides slightly divergent posteriorly; in posterior half semi-circular; interantennal furrows indifferent; setiferous punctation moderately deep and sparse; on average, interstices between punctures two to three times as wide as diameter of punctures; surface without microsculpture; polished; antennae with first antennomere elongate; slightly longer than half-length of head; second and third antennomere conical; longer than wide; combined half as long as first antennomere; following antennomere transverse; longer than wide; apically increasing in width. Pronotum: 0.92 mm long, 0.57 mm wide; widest in anterior third; narrowed to neck in convex curve; posteriorly, sides abruptly narrowed in middle; in posterior half nearly parallel; posterior angles sub-rectangular; posterior margin slightly convex; setiferous punctation as deep as on head, but slightly denser; on average, interstices between punctures 1–1.5 times as wide as diameter of punctures; narrow mid-line impunctate; surface without microsculpture; polished. Elytra: 0.82 mm long, 0.68 mm wide; humeral angles obtuse; posteriorly, sides slightly divergent; posterior angles sub-rectangular; posterior margin slightly retreated to suture; setiferous punctation as deep and dense as on head; on average, interstices between punctures twice as wide as diameter of punctures; surface without microsculpture; polished. Abdomen with fine and sparse setiferous punctation; surface without microsculpture; polished; sternite VII of male slightly emarginate at posterior edge; tergite VII of male at posterior edge straight; meso-tibia and meta-tibia with 4 ctenidia each. Aedeagus oval with sub-rectangular anterior angles; dorsal plate nearly covering central lobe; paramere long and slender; shortly curved at apex; numerous sensillae from base to apex.

Etymology. The species name honours Zack Falin, who sampled extensively in the Neotropical Region and who also found this species.

Geography. Suriname.

Ecology. Unknown.

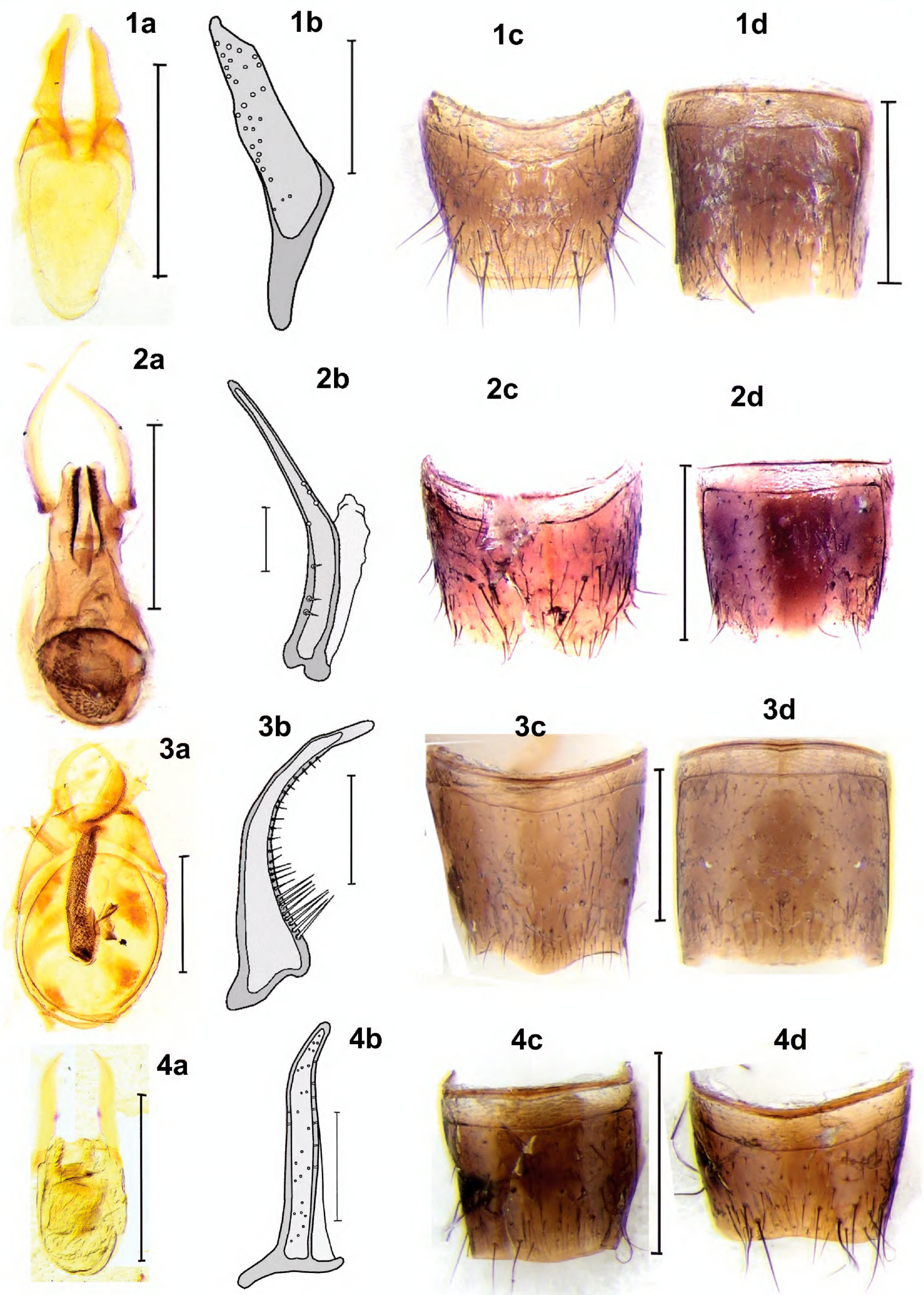
***Lithocharodes hansonii* sp. nov.**

<https://zoobank.org/2A3B0237-BA1F-4ECB-A788-BE149B4684D9>

Figs 5a–d, 19E

Material examined. Holotype: COSTA RICA male; Puntarenas; R.F. Golfo Dulce; 24 km W Piedras Blancas; 20 m elevation; Dec 1991; P. Hanson leg.; KNHM.

Paratypes: COSTA RICA 1 male; Osa Peninsula; Fundación Neotrop.; 10 km W Rincon; 8°42'30"N, 83°31'30"W; Berlese; forest litter; 22 Jun 1997; R. Anderson leg.; KNHM CR1A97 026A; 1 male; from



Figures 1–4. 1. *Lithocharodes andersoni*; 2. *L. dubia*; 3. *L. esmeraldae*; 4. *L. falini*. **a.** Aedeagus; **b.** Paramere; **c.** Sternite VII; **d.** Tergite VII. Scale bars: 0.5 mm (**a**, **c**, **d**); 0.1 mm (**b**).

same location; 8°45'30"N, 83°25'0"W; 20 m elevation; 21 Jun 1997; R. Anderson leg.; KNHM CR1A97 025D.

Diagnosis. According to the small size of the dorsal plate of the aedeagus, *L. hansonii* belongs to the *L. obscura*-group. It differs from *L. obscura* Irmeler, 2021 by the narrow sclerotised edge along the apical orifice and the shape of the parameres that are elongate and slender in *L. obscura*, but broader with acute top in *L. hansonii*. The overall characters of both species are also very similar by the black colour, punctuation and shape of the head (PS:E ratio approximately three in both species). The head is slightly emarginated in front of neck in *L. obscura*, but approximately semi-circular in *L. hansonii*. *L. hansonii* is slightly shorter with 4.5 mm length than *L. obscura* with 5.2 mm length.

Description. Length: 4.5 mm; Colouration: completely black; legs and antennae dark brown.

Head: 0.74 mm long, 0.59 mm wide; eyes moderately large; not prominent; PS:E ratio 3.5; post-ocular sides slightly divergent to posterior angles; posterior angles obtuse; posterior edge approximately semi-circular in front of neck; setiferous punctuation moderately deep and dense; on average, interstices between punctures as wide as to 1.5 times as wide as diameter of punctures; surface without microsculpture; polished; antennae with first antennomere elongate; longer than half-length of head; second and third antennomere conical, longer than wide; combined half as long as first antennomere; following antennomeres transverse; apically increasing in width. Pronotum: 0.96 mm long, 0.52 mm wide; widest in front of anterior third; posteriorly, sides slightly convergent; posterior angle combined with posterior margin semi-circular; setiferous punctuation deeper and moderately denser than on head; a long wide impunctate mid-line, with irregular line of approximately 18 punctures; on average in lateral part, interstices between punctures 1.5 times as wide as diameter of punctures; surface without microsculpture; polished. Elytra: 0.81 mm long, 0.73 mm wide; humeral angles obtuse; posteriorly, sides nearly parallel; posterior angles sub-rectangular; posterior margin retreated to suture; setiferous punctuation deeper and denser than on head and pronotum; irregularly dense; on average, interstices between punctures as wide as diameter of punctures; surface without microsculpture; polished. Abdomen with fine and moderately dense setiferous punctuation; surface without microsculpture; polished; sternite VII of male with posterior margin slightly convex; posterior margin of tergite VII of male straight; meso-tibia with 2, meta-tibia with 3 ctenidia. Aedeagus elongate; 3.6 times as long as wide; dorsal plate small; circular with apical bump; translocated to posterior edge; apex prominent; endophallus transparent; elongate; apical orifice crevice-like; at inner side sclerotised; parameres moderately long; bilobed; inner lobe approximately 0.4 times as long as central lobe; thick at base; in apical half, abruptly narrowed to acute top; in narrow apical part, with few sensillae, outer lobe of same shape as inner lobe, but transparent.

Etymology. The species name honours the collector of the species, P. Hanson, who collected a lot of species in Central America.

Geography. South-eastern Costa Rica.

Ecology. Floor of lowland rain forest.

***Lithocharodes hibbsi* sp. nov.**

<https://zoobank.org/DE8A2F02-5115-469F-8539-FD95E338D3C8>

Figs 6a–d, 19F

Material examined. Holotype: ECUADOR male; Pichincha; Quito; Maquipucuna Station; 1600–1650 m elevation; flight intercept trap; 8–18 Apr 1996; P. Hibbs leg.; KNHM ECU1H96 012.

Paratypes: ECUADOR 1 female; from same location as holotype; 18 Apr–5 May 1996; KNHM ECU1H96 013; 1 female; Esmeraldas; Bilsa; 0°20'0"S, 79°43'0"W; flight intercept trap; 18 Apr–10 May 1996; P. Hibbs leg.; KNHM ECU1H96 015; 1 male, 1 female; from same location as holotype but; 5 Jun–7 Jul 1996; KNHM ECU1H96 014; 1 female; same data; UIC ECU1H96 014; 1 female; Napo, Sierra Azul; Hacienda Aragon; 2300 m elevation: 0°40'0"S, 77°55'0"W; flight intercept trap; 17 Feb–26 Mar 1996; P. Hibbs leg. KNHM ECU1H96 009; 1 male Pichincha; Otongatchi Nat. Res.; leaf litter; 26.8.2009; Ramon leg; UIC.

Diagnosis. According to the structure of the aedeagus, *L. hibbsi* is added to the *L. verhaaghi*-group due to the oval shape of the central lobe and the shape and minute teeth of the endophallus. The species is characterised within the group and all other *Lithocharodes* species by the slender body. In this respect, it resembles species of the genus *Somoleptus*, but the structure of the aedeagus equals that of *Lithocharodes*. The aedeagus of *L. hibbsi* mostly resembles that of *L. peruanus* Irmeler, 2021 by the structure of the thick endophallus, but has only one torsion.

Description. Length: 5.6 mm; Colouration: blackish; pronotum in anterior part lighter than on posterior half; legs and antennae light brown.

Head: 0.98 mm long, 0.69 mm wide; elongate; PS:E ratio 3.4; without posterior angles; smoothly curved sides continuing to widely rounded posterior part; setiferous punctuation moderately deep and dense; on average, interstices between punctures twice as wide as diameter of punctures; surface without microsculpture; polished; antennae with first antennomere elongate; three fourths as long as head; second and third antennomere conical; third longer than second; combined half as long as first antennomere; following antennomeres transverse; on average, twice as wide as long; apically increasing in width. Pronotum: 1.09 mm long, 0.67 mm wide, in front of posterior angles 0.57 mm; widest in anterior third; posterior half narrower; slightly divergent to widely rounded posterior angles; posterior margin nearly semi-circular; setiferous punctuation irregular; moderately deep and dense; on average, interstices between punctures as wide as to twice as wide as diameter of punctures; wide mid-line impunctate; surface without microsculpture; polished. Elytra: 1.05 mm long, 0.99 mm wide; humeral angles obtuse; sides approximately parallel; posterior angles sub-rectangular; posterior margin retreated to suture; setiferous punctuation denser than on pronotum; surface without

microsculpture; polished. Abdomen with fine and sparse setiferous punctation; surface without microsculpture; polished; posterior margin of sternite VII of male convex; nearly semi-circular; tergite VII of male with straight posterior margin; meso- and meta-tibia with four ctenidia each. Aedeagus oval with semi-rectangular anterior margin; dorsal plate of central lobe large covering nearly total central lobe; endophallus thick, covered by minute teeth; one torsion dividing endophallus in thick posterior and short, narrow anterior part; paramere three fourths as long as central lobe; divided in long straight and short curved upper part; nearly hook-like; in basal part, with numerous short setae; in basal half, several sensillae at outer edge; in upper half, several sensillae at inner edge and few sensillae at outer edge.

Etymology. The species name honours P. Hibbs, who sampled in particular in various Ecuadorian regions.

Geography. Ecuador.

Ecology. Cloud forest between 1600 and 2500 m elevation from February to June.

***Lithocharodes lituratus* sp. nov.**

<https://zoobank.org/E1BE0BED-DBF9-4190-8CA4-AF15CFC96C41>
Figs 7a–d, 20A

Material examined. Holotype: ECUADOR male; Pichincha; Maquipucuna For. Res.; 50 km Quito; 1300 m elevation; banana duff; berlesate; 23 Dec 1991; C. Carlton, R. Leschen leg.; KNHM #72.

Paratypes: ECUADOR 1 female; same data as holotype; KNHM ECU1A99; 1 male; same location as holotype but; 0°7'0"N, 78°38'6"W; 1200 m elevation; montane evergreen forest litter; 27 Oct 1999; R. Anderson leg.; KNHM ECU1A99 208D.

Diagnosis. According to the structure of the aedeagus, *L. lituratus* belongs to the *L. sordida*-group that is also characterised by short and thick parameres. Colouration of *L. lituratus* is similar as in *L. bicornis* Irmeler, 2021 by the lighter brown parts on elytra and pronotum. In contrast to *L. lituratus*, *L. sordida* Sharp, 1885 is nearly black. The species can be easily differentiated from these two species by the slenderer shape and the sparser punctation. The location, Ecuador, is between that of the two other species in Peru and Panama.

Description. Length: 6.4 mm; Colouration: blackish with indistinct lighter spots on humeral angles of elytra. Legs and antennae light brown.

Head: 0.93 mm long, 0.79 mm wide; eyes slightly prominent; PS:E ratio 5.2; without posterior angles; posteriorly, widely rounded; inter-antennal furrows short; between eyes with indistinct depression; setiferous punctation moderately fine and sparse; on average, interstices between punctures nearly twice as wide as diameter of punctures; at sides and at posterior margin, punctation deeper and denser than in centre; surface without microsculpture; polished; antennae with elongate first antennomere; longer than half-length of head; second and third antennomere each nearly twice as long as wide; combined half as long as first

antennomere; following antennomeres transverse; approximately twice as wide as long; apically increasing in width. Pronotum: 1.24 mm long, 0.79 mm wide, widest in anterior third; in posterior part, slightly convergent, but nearly parallel; posterior margin nearly semi-circular; at posterior angle, 0.8 times as wide in anterior part; setiferous punctation deeper and denser than on head; on average, interstices half as wide as diameter of punctures; wide mid-line impunctate; surface without microsculpture; polished. Elytra: 1.05 mm long, 0.92 mm wide; humeral angles obtuse; posteriorly, sides approximately parallel; posterior angles sub-rectangular; posterior margin retreated to suture; setiferous punctation finer, but as dense as on pronotum; surface without microsculpture; polished. Abdomen with fine and sparse punctation; without microsculpture; polished; posterior margin of sternite VII of male sinuate with slightly prominent centre; posterior margin of tergite VII of male triangularly prominent; meso-tibia with 5, meta-tibia with 3 ctenidia. Aedeagus oval with sub-rectangular apical part; dorsal plate of central lobe covering nearly total central lobe; endophallus with several torsions, covered by long teeth; paramere short and thick; at apex, abruptly narrowed to acute top at inner edge; in basal part with few sensillae; at inner edge, near apex with few setae.

Etymology. The species name is derived from the same Latin word *lituratus* meaning “spotted” and refers to the yellow spots on the elytra.

Geography. Western Ecuador.

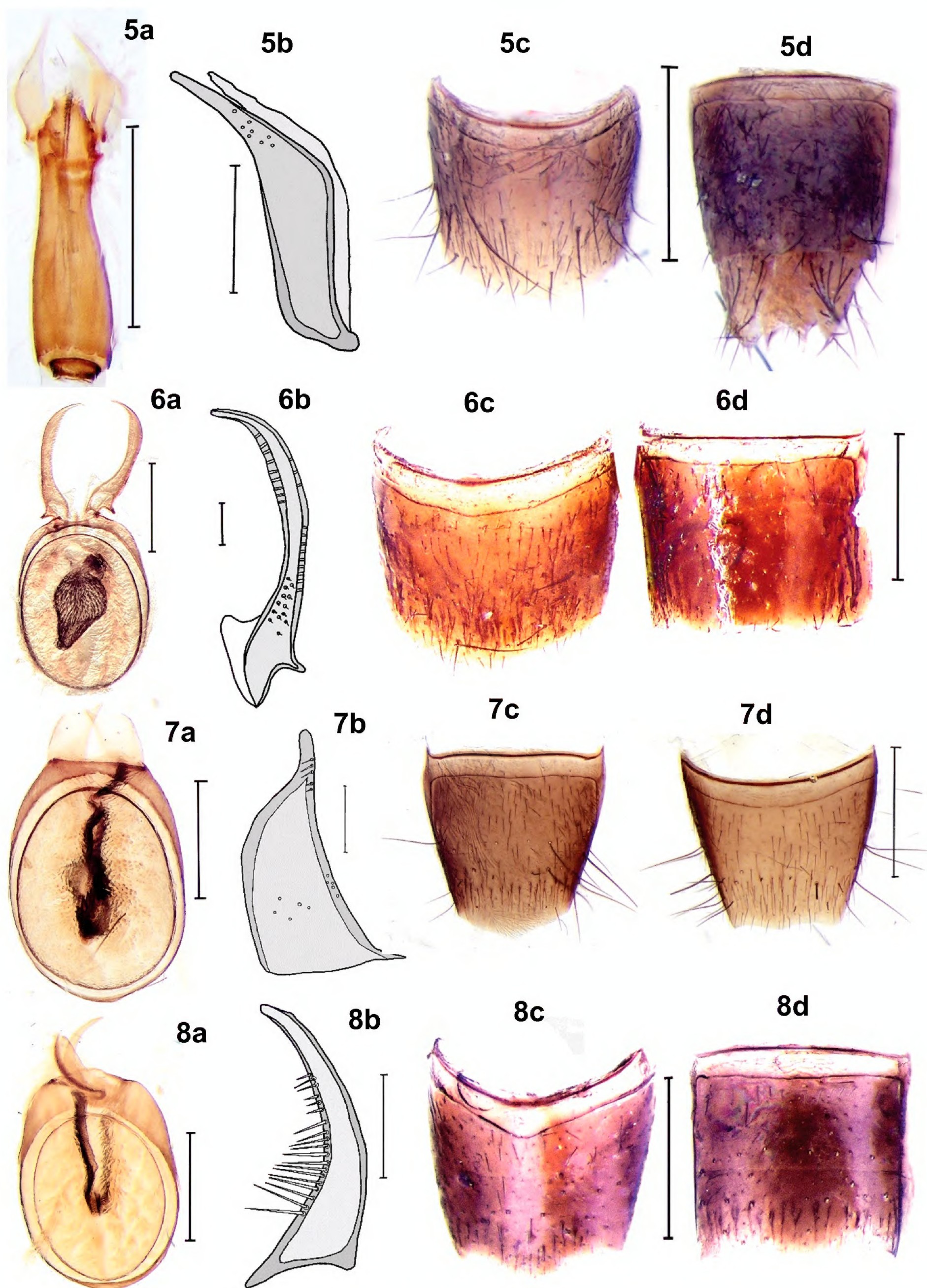
Ecology. Montane forest and similar agricultural plantations at approximately 1600 m elevation from October to December.

***Lithocharodes montanus* sp. nov.**

<https://zoobank.org/4D2C1D93-B5D7-4CDE-A3CA-4075FA65E66C>
Figs 8a–d, 20B

Material examined. Holotype: ECUADOR male; Pichincha; Maquepucuna Biological Station; 0°5'34"N, 78°37'37"W; 1600 m elevation; ridgetop montane forest litter; mixed Cecropia/cloud forest; 29 Oct 1999; R. Anderson leg.; KNHM ECU1A99 214B.

Paratypes: ECUADOR 2 females; same data as holotype KNHM ECU1A99 214B; 1 male; Pichincha; Maquepucuna Biological Station; Principal Trail; 0°7'22"N, 78°39'0"W; 1275 m elevation; flight intercept trap; 27–29 Oct 1999; Z.H. Falin leg.; KNHM ECU1F00 048; 1 female, same location but; 0°7'0"N, 78°38'6"W; 1200 m elevation; montane evergreen forest litter; 27 Oct 1999; R. Anderson leg.; KNHM ECU1A99 208D; 1 female; same data; UIC ECU1A99 208D; 1 female, same location but; 0°5'34"N, 78°37'37"W; 1620 m elevation; ridgetop montane forest litter; 29 Oct 1999; R. Anderson leg.; KNHM ECU1A99 213E, 2 females; same location but; 0°6'25"N, 78°37'18"W; montane evergreen forest litter; 1480 m elevation; 27 Oct 1999; R. Anderson leg.; KNHM ECU1A99 209A; 1 female; same location but; 50 km NW Quito; 1300 m elevation; banana duff; berlesate; 23 Dec



Figures 5–8. 5. *Lithocharodes hansonii*; 6. *L. hibbsii*; 7. *L. lituratus*; 8. *L. montanus*. a. Aedeagus; b. Paramere; c. Sternite VII; d. Tergite VII. Scale bars: 0.5 mm (a, c, d); 0.1 mm (b).

1991; C. Carlton, R. Leschen leg.; KNHM #72 (KNHM); 1 female; Esmeraldas; Bilsa; 0°20'0"S, 79°43'0"W; flight intercept trap; 5 Jun–7 Jul 1996; P. Hibbs leg.; KNHM ECU1H96 014; 1 female; same location but; 28 Apr–10 May 1996; P. Hibbs leg.; KNHM ECU1H 015.

Diagnosis. The structure of the aedeagus characterises *L. montanus* as a member of the *L. simillima*-group by the elongate endophallus with lobes. It differs from the other species of the group by the elongate head with short eyes. Eyes are less than one fifth as wide as postocular space. The other species of the group have mostly a triangular head with distinctly larger eyes. *Lithocharodes somoleptoides* Irmeler, 2021 has a similar shape of the head, but the endophallus has distinct torsions, which are absent in *L. montanus*.

Description. Length: 6.0 mm; Colouration: completely blackish; legs and antennae yellow brown.

Head: 1.02 mm long, 0.78 mm wide; eyes short; PS:E ratio nearly 5.2; postocular sides parallel; without postocular angles; posterior part rounded; nearly semi-circular; inter-antennal furrows indistinct; indistinct depression between eyes; setiferous punctation moderately deep and dense; on average, interstices between punctures 1–1.5 times as wide as diameter of punctures; surface without microsculpture; polished; antennae with first antennomere elongate; half as long as head; second and third antennomere triangular; longer than wide; combined longer than half-length of first antennomere; following antennomeres transverse; on average, twice as wide as long; width increasing to apex. Pronotum: 1.21 mm long, 0.72 mm wide; sides parallel; anterior and posterior part nearly semi-circular; without distinct angles; setiferous punctation deep and dense; on average, interstices between punctures less wide than diameter of punctures; wide mid-line impunctate. Elytra: 1.22 mm long, 0.98 mm wide; humeral angles obtuse; posteriorly, sides slightly divergent; posterior margin retreated to suture; setiferous punctation deep and dense, but slightly finer and sparser than on pronotum; on average, interstices between punctures as wide as to slightly less wide as diameter of punctures; surface without microsculpture; polished. Abdomen finely and sparsely punctate; surface without microsculpture; polished; sternite VII of male with posterior margin sinuate with distinct prominent centre; posterior margin of tergite VII of male less sinuate as sternite; meso-tibia with 4, meta-tibia with 3 ctenidia. Aedeagus oval with sub-rectangular anterior margin; dorsal plate nearly total covering central lobe; endophallus elongate with one basal and one apical torsion; covered by short lobes in central part, teeth-like structures in basal part and smaller lobes in apical part; paramere lunulate; on inner edge with long setae at base and shorter setae near apex.

Etymology. The species name is derived from the Latin word *mons* and refers to the high montane area, where it was collected in Ecuador.

Geography. Western Ecuador.

Ecology. Floor of montane and cloud forests or similar agricultural systems between 1300 and 1600 m elevation from October to May.

Lithocharodes parallelus sp. nov.

<https://zoobank.org/D2451944-EF38-458B-8B44-5B4D9DBD4EF9>
Figs 9a–d, 20C

Material examined. Holotype: ECUADOR male; Sucumbios; Sacha Lodge; 0.5°S, 76.5°W; 270 m elevation; malaise trap; 22 II – 4 III 1994; P. Hibbs leg.; KNHM.

Paratypes: ECUADOR 4 females, 1 male; Sucumbios; Sacha Lodge; 0°28'14"S, 76°27'35"W; 270 m elevation; flight intercept trap; 21–24 Mar 1999; R. Brooks leg.; KNHM ECU1B99 047; 1 male; same data; UIC ECU1B99 047; 1 female; same location; 0°3'0"S, 76°3'0"W; malaise trap; 10–20 Sep 1999; P. Hibbs leg. KNHM ECU1H99 010A; 2 males, 2 females; same location 0.5°S, 76.5°W; malaise trap; 3–13 IV 1995; 14–24 V 1994; 12–22 II 1994; 27 VIII – 10 IX 1994; P. Hibbs leg.; KNHM; 1 male same data; 10–21 X 1994; P. Hibbs leg.; UIC; 2 females; Napo; Yuturi Lodge; 0°32'54"S, 76°2'18"W; Rio Napo; 270 m elevation; flight intercept trap; 20–21 Mar 1999; R. Brooks, D. Brzoska leg.; KNHM ECU1B99 010; COLOMBIA 1 male; Meta; PNN Tinigua Caño Nevera; 2°11'N, 73°48'W; 390 m elevation; malaise trap; 7–16.II.2002; C. Sanchez leg.; KNHM M.2334; PERU 1 female; Dept. Loreto; 1.5 km N Teniente Lopez; 2°36'66"S, 76°06'92"W; 210–240 m elevation; flight intercept trap; 24 July 1993; 22 July 1993; R. Leschen leg.; KNHM #192.

Diagnosis. *Lithocharodes parallelus*, as well as the already described *L. andersoni* sp. nov., belongs to the *L. hanagarthi*-group due to the structure of the aedeagus. It has a large dorsal plate of the central lobe and a transparent endophallus. Thus, four species are actually in this group. Parameres of *L. parallelus* resemble those of *L. boliviana* Irmeler, 2021 and *L. hanagarthi* Irmeler, 2021. Within the group, *L. parallelus* is characterised by the markedly parallel shape of the body, in particular, of the head and the pronotum. Moreover, the structure of sternite VII of the male is unique in the Neotropical *Lithocharodes* species with its setose posterior margin.

Description. Length: 5.3 mm; Colouration: completely black; legs and antennae light brown.

Head: 0.88 mm long, 0.72 mm wide; eyes slightly prominent; PS:E ratio 2.8; postocular sides parallel; posterior angles obtuse; sub-rectangular; inter-antennal furrows reaching nearly posterior edge of eyes; indistinct depression between eyes; setiferous punctures moderately deep and dense; on average, interstices between punctures nearly twice as wide as diameter of punctures; surface without microsculpture; polished; antennae with first antennomere elongate; slightly longer than half-length of head; second and third antennomere triangular; longer than wide; combined slightly longer than half-length of first antennomere; following antennomeres wider than long; apically increasing in width. Pronotum: 1.15 mm long, 0.70 mm wide; parallel; anterior and posterior part without distinct angles; anterior and posterior margins nearly semi-circular; setiferous punctation as deep as on head, but slightly

denser; on average, interstices between punctures as wide as diameter of punctures; wide mid-line impunctate. Elytra: 0.95 mm long, 0.84 mm wide; humeral angles obtuse; sides parallel; posterior angles sub-rectangular; posterior margin only slightly retreated to suture; setiferous punctation deeper and denser than on pronotum; on average, interstices between punctures slightly shorter than diameter of punctures; surface without microsculpture; polished. Abdomen much finer and sparser punctate than fore-body; surface without microsculpture; polished; posterior margin of sternite VII of male semi-circular with concave emargination; posterior margin covered with long black setae grouped to tapered clusters; tergite VII of male with sinuate posterior margin forming pair of short central prominences; meso-tibia with 4, meta-tibia with 3 ctenidia. Aedeagus long oval with wide orifice at apex; endophallus transparent; parameres extremely long; as long as central lobe; lunulate; covered by numerous sensillae and setae; setae differing in length; apical setae extremely fine and short; setae at outer edge and in centre longer and thicker.

Etymology. The species name is derived from the Latin word *parallelus* meaning “parallel” and refers to the parallel sides of the pronotum.

Geography. Eastern Andean slope from northern Peru to Columbia.

Ecology. Floor of montane forests at approximately 300 m elevation.

***Lithocharodes zamorae* sp. nov.**

<https://zoobank.org/5FD29ADF-5407-4118-AC62-D548A7EA73CC>

Figs 10a–d, 20D

Material examined. Holotype: ECUADOR male; Zamora-Chinchipe; Rio Bambuscaro; 4°7'0"S, 78°59'0"W; flight intercept trap; 26 Jun – 4 Jul 1996; P. Hibbs leg.; KNHM ECU1H96 001.

Diagnosis. According to the structure of the endophallus, *L. zamorae* should be assigned to the *L. fuscipennis*-group because the elongate endophallus is covered by minute teeth in the basal part, but short lobes are also present in the straight apical part. Size and punctation of the head mostly resemble *L. nigripennis* (LeConte, 1863). Postocular space in *L. nigripennis* is distinctly longer (PS:E ratio 3.6) than in *L. zamorae* (PS:E ratio 3.1) and front part of the pronotum in *L. zamorae* is narrower.

Description. Length: 5.6 mm; Colouration: completely black; legs and antennae lighter brown.

Head: 0.89 mm long, 0.74 mm wide; eyes moderately large; slightly prominent; postocular sides slightly divergent; P:S ratio 3.1; setiferous punctation deep and dense; irregular; on most parts, interstices half as wide as diameter of punctures; along sparsely punctate mid-line, interstices distinctly wider; partly impunctate; surface without microsculpture; polished; antennae with first antennomere slightly shorter than half-length of head; second and third antennomere longer than wide; combined longer than half-length of first antennomere. Pronotum: 1.07 mm long, 0.71 mm wide; widest in front of anterior third; 1.16 times as

wide as in posterior third; sides slightly convergent posteriorly; anterior and posterior angles obtuse; posterior margin approximately semi-circular; setiferous punctation as deep as, but less dense than on head; on average, interstices at least as wide as diameter of punctures; wide mid-line impunctate; surface without microsculpture; polished. Elytra: 1.01 mm long, 0.94 mm wide; humeral and posterior angles sub-rectangular; sides nearly parallel; posterior margin slightly retreated to suture; setiferous punctation deep and dense; on average, interstices between punctures half as wide as diameter of punctures; surface without microsculpture; polished. Abdomen with setiferous punctation finer and sparser than on fore-body; sternite VII of male with emarginate posterior margin; within emargination sinuate; posterior margin of tergite VII of male slightly convex; meso- and meta-tibia with 2 ctenidia each. Aedeagus oval; anteriorly sub-rectangular; dorsal plate covering nearly total central lobe; divided in anterior third; endophallus elongate; with wide basal part covered by minute teeth and narrow apical part with short lobes; parameres short; hook-like; inner edge with numerous setae.

Etymology. The species name is derived from the Ecuadorian Province Zamora-Chinchipe.

Geography. Southern Ecuador.

Ecology. Unknown.

***Somoleptus alajuelae* sp. nov.**

<https://zoobank.org/F8BB23D3-BE1D-427C-943E-1806F5C812BF>

Figs 11a–d, 20E

Material examined. Holotype: COSTA RICA male; Alajuela; San Ramon; 5 km W; 1200 m elevation; 1–31 Dec 1997; P. Hanson leg.; KNHM CR1HAN92-97 14.

Paratypes: COSTA RICA 1 male; Puntarenas; Monte Verde; 1400 m elevation; 14 May 1989; J. Ashe, R. Brooks, R. Leschen leg.; Snow Entomol. Mus. Expedition KNHM #188; 1 male; San José; Zuruqui de Moravia; 1600 m elevation; April-May 1993; P. Hanson leg.; KNHM; 1 male; Guanacaste; Cacao Biological Station; 10°56'N, 85°27'W; 1000 m elevation; tree-fall litter; 5 May 1995; J.S. Ashe leg.; KNHM.

Diagnosis. The structure of the aedeagus of *S. alajuelae* does not fit to any of the known *Somoleptus* groups. The processes at the aedeagal orifice are neither brush-like nor translocated into the inner part. Thus, the overall structure of the aedeagus is unique within the Neotropical *Somoleptus* species. Together with *Somoleptus paramocola* sp. nov., it forms a new sub-group of the *S. alticola*-group. According to the total size and length of eyes, *S. alajuelae* resembles *S. subtilis* (Erichson, 1839). Even the shape of the aedeagus and the unique shape of the apical processes are vaguely similar to *S. subtilis*. In contrast to *S. subtilis*, *S. alajuelae* is totally black. The differences to *S. paramocola* are listed there.

Description. Length: 3.69 mm; Colouration: completely black; antennae light brown; legs even lighter brown.

Head: 0.67 mm long, 0.51 mm wide; eyes prominent; large; PS:E ratio 2.6; sides slightly divergent; without

posterior angles; posterior part widely rounded; nearly semi-circular; inter-antennal furrows divergent; reaching mid-length of eyes; setiferous punctation deep and dense; between eyes partly coriaceous; narrow mid-line between eyes and wide mid-spot on disc impunctate; on average, interstices between punctures of hind-head half as wide as diameter of punctures; surface without microsculpture; polished; antennae with first antennomere elongate; shorter than half-length of head; second and third antennomere conical; combined half as long as first antennomere; following antennomeres transverse; apically increasing in width. Pronotum: 0.79 mm long, 0.48 mm wide; widest at anterior third; posteriorly slightly divergent; posterior angles sub-rectangular; setiferous punctation irregular; anteriorly denser than posteriorly; in posterior half, interstices at least as wide as diameter of punctures; wide mid-line impunctate. Elytra: 0.72 mm long, 0.63 mm wide; humeral angles obtuse; sides parallel; posterior angles sub-rectangular; posterior margin slightly retreated to suture; setiferous punctation irregular; in apical part, extremely deep and dense; nearly coriaceous; in posterior part sparser; on average, interstices half as wide as diameter of punctures; surface without microsculpture; polished. Abdomen finely and sparsely punctate; surface without microsculpture; polished; sternite VII of male with slightly convex posterior margin; tergite VII of male with triangularly prominent posterior margin; meso-tibia with 5, meta-tibia with 3 ctenidia. Aedeagus nearly circular; dorsal plate covering nearly total central lobe; apical orifice large; with pair of non-brushed prominences formed like cow horns; C:A ratio 0.3; parameres slightly projecting horn-like processes; bilobed; inner lobe with wide base; abruptly narrowed apically; hook-like top; at apex with several long setae and few elongate sensillae; outer lobe transparent; narrow; slightly curved.

Etymology. The species name is derived from the Costa Rican Province Alajuela.

Geography. Western Costa Rica.

Ecology. Forest floor between 1000 and 1600 m elevation from December to May.

***Somoleptus curtioculatus* sp. nov.**

<https://zoobank.org/E088304A-4F93-46D5-9741-F7456E420B4E>

Figs 12a–d, 20F

Material examined. Holotype: MEXICO male; Guerrero; 15 km SW Filo de Caballo; 2500 m elevation; oak forest (wet) litter; Berlese; 16 July 1992; R.S. Anderson leg.; KNHM #92-011.

Diagnosis. *S. curtioculatus* belongs to the *Somoleptus* longicollis-subgroup due to the bilobed paramere and the triangularly prominent sternite VII of male. Concerning the short eyes and elytra, *S. curtioculatus* resembles *Somoleptus longiceps* Irmeler, 2022. In comparison to *S. longiceps*, eyes in *S. curtioculatus* are much shorter with PS:E ratio 7.8 (in *S. longiceps* PS:E ratio is 5.4). Moreover, *S. curtioculatus* is yellow-brown, whereas *S. longiceps* is black with slightly lighter head and anterior half of pronotum.

Description. Length: 3.9 mm; Colouration: yellow-brown; abdomen slightly darker; legs and antennae yellow-brown.

Head: 0.62 mm long, 0.47 mm wide; eyes extremely short; PS:E ratio 7.8; posterior angles widely rounded; inter-antennal furrows short; not reaching front edge of eyes; setiferous punctation moderately deep and dense; on average, interstices 1.5 times as wide as diameter of punctures; in apical half with narrow impunctate mid-line; surface without microsculpture; polished; antennae with elongate first antennomere; half as long as total head length; second and third antennomere conical; combined slightly shorter than half-length of first antennomere; following antennomeres at least twice as wide as long; apically increasing in width. Pronotum: 0.72 mm long, 0.45 mm wide; widest at anterior third; strongly narrowed to neck; posteriorly nearly parallel; posterior angles sub-rectangular; setiferous punctation moderately deep and dense; in apical half, denser than on posterior half; on average, interstices between punctures 1–1.5 times as wide as diameter of punctures; wide mid-line impunctate; surface without microsculpture; polished. Elytra: 0.49 mm long, 0.52 mm wide; humeral angles obtuse; sides slightly divergent posteriorly; posterior margin slightly retreated to suture; setiferous punctation moderately deep and dense; on average, interstices between punctures 1.5 times as wide as diameter of punctures; surface without microsculpture; polished. Abdomen with setiferous punctation denser than on elytra, but as deep; posterior margin of sternite VII of male triangularly prominent; posterior margin of tergite VII of male slightly convex; meso- and meta-tibia with one ctenidium each. Aedeagus oval; anteriorly sub-rectangular; dorsal plate covering nearly total central lobe; shortly divided at apex; endophallus with two torsions dividing endophallus in thicker basal part and narrower apical part; basal part with minute teeth; apical part with short lobes; cones at apical orifice short; C:A ratio 0.1; parameres bilobed with slender inner lobe and nearly circular outer lobe; inner lobe with three moderately long setae; outer lobe transparent.

Etymology. The species name is a combination of the Latin word *curtus* meaning short and *oculus* meaning eye and refers to the short eyes.

Geography. Southern Mexico.

Ecology. Floor of high montane forests at approximately 2500 m elevation.

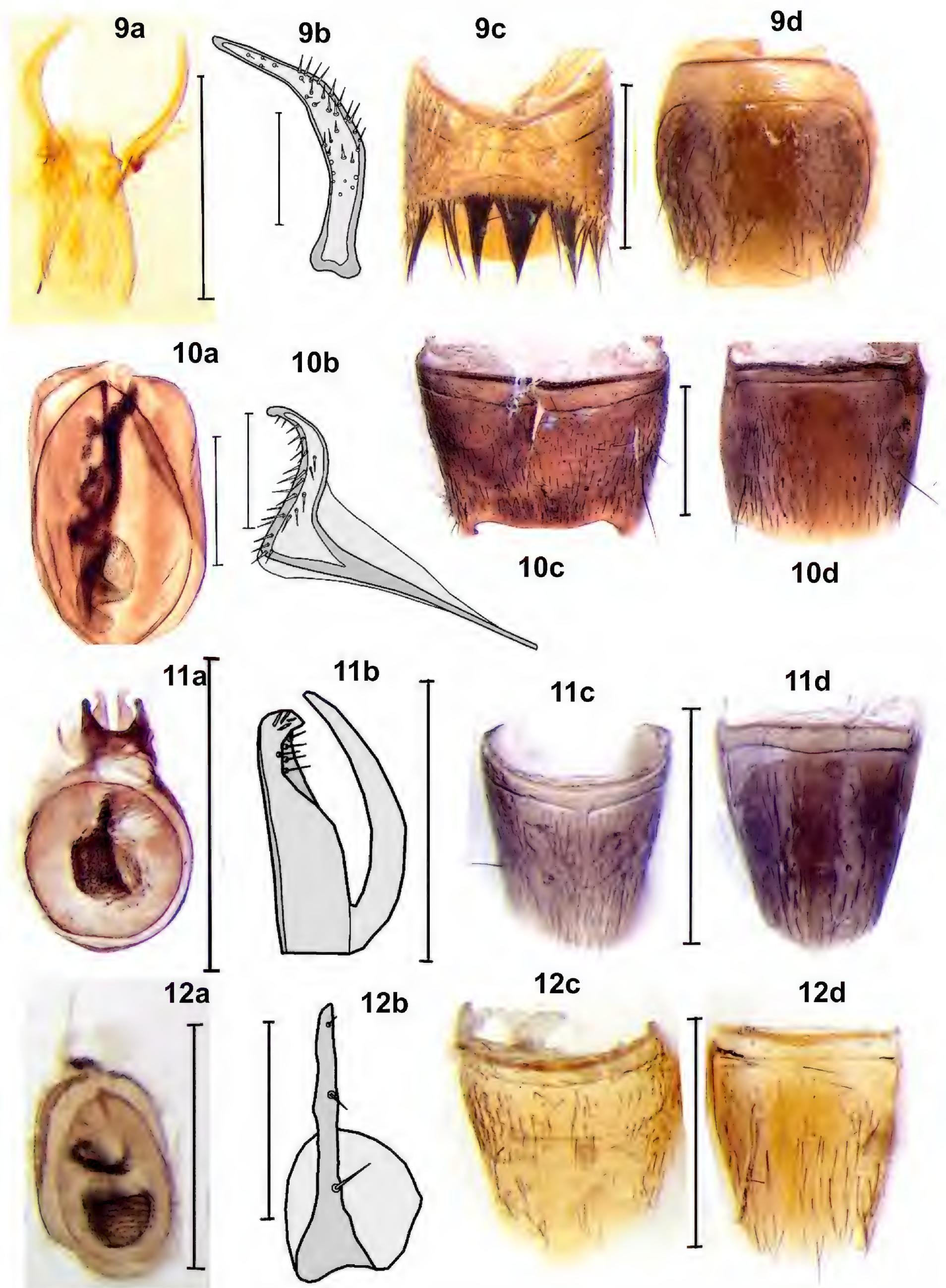
***Somoleptus densiceps* sp. nov.**

<https://zoobank.org/F5F35C18-A269-4EEA-9A43-C1EAD7A46E47>

Figs 13a–d, 21A

Material examined. Holotype: PANAMA male; Chiriqui; 5.6 km N Boquete; La Culebra Trail; 8°49'23"N, 82°25'18"W; 1450 m elevation; oak forest litter; 19 VI 1996; R. Anderson leg.; KNHM PAN2A96 96-141B.

Diagnosis. *Somoleptus densiceps* is part of the *Somoleptus* longicollis-group due to the brush-like cones of the aedeagus and the shape of sternite VII of male. Amongst the Neotropical *Somoleptus* species, *S. densiceps* mostly resem-



Figures 9–12. 9. *Lithocharodes parallelus*; 10. *L. zamorae*; 11. *Somoleptus alajuelae*; 12. *S. curtioculatus*. a. Aedeagus; b. Paramere; c. Sternite VII; d. Tergite VII. Scale bars: 0.5 mm (a, c, d); 0.1 mm (b).

bles *S. mexicanus* Irmeler 2022 by the deep and dense punctation, the short eyes and the slightly triangular shape of the head. Parameres are also very similar between both species. In comparison with *S. mexicanus*, punctation on total fore-body in *S. densiceps* is much denser, nearly coriaceous.

Description. Length: 4.0 mm; Colouration: completely black; antennae dark brown, legs lighter brown.

Head: 0.68 mm long, 0.54 mm wide; eyes moderately large; PS:E ratio 3.8; postocular sides slightly divergent; posterior part combined with posterior edge semi-circular; inter-antennal furrows indistinct; setiferous punctation deep and extremely dense; on average, interstices shorter than one fourth of diameter of punctures; at sides, partly coriaceous; in apical part, between eyes with indistinct impunctate mid-line; surface without microsculpture; due to dense punctation scarcely shiny. Antennae with first antennomere elongate; half as long as total head-length; second and third antennomere conical; longer than wide; combined half as long as first antennomere; following antennomere at least twice as wide as long; apically, increasing in width. Pronotum: 0.80 mm long, 0.53 mm wide; widest at anterior third; strongly convergent to neck; posteriorly slightly convergent to sub-rectangular angles; setiferous punctation dense and extremely dense; partly coriaceous; on average, interstices between punctures one fourth as wide as diameter of punctures; wide mid-line impunctate with three single punctures; surface without microsculpture; polished. Elytra: 0.74 mm long, 0.67 mm wide; humeral angles obtuse; sides approximately parallel; posterior angles sub-rectangular; posterior margin slightly retreated to suture; setiferous punctation deep and dense; on average, interstices as wide as half-length of diameter of punctures; surface without microsculpture; shiny. Abdomen with setiferous punctation dense, but much finer than on fore-body; surface without microsculpture; shiny; posterior margin of sternite VII of male slightly triangular with short central knob; tergite VII of male with straight posterior margin; meso-tibia with 5, meta-tibia with 2 ctenidia. Aedeagus oval with sub-rectangular anterior margin; dorsal plate covering nearly total central lobe; endophallus elongate with one torsion; covered by short lobes; cones at apical orifice long; C:A ratio 0.34; paramere bilobed; inner lobe elongate with several long setae at inner edge; outer lobe circular; transparent.

Etymology. The species name is a combination of the Latin word *densus* meaning dense and *ceps* (short form of *caput*) meaning “head” and refers to the dense punctation of the head.

Geography. Panama.

Ecology. Forest floor of montane forests at approximately 1500 m elevation.

Somoleptus guianensis sp. nov.

<https://zoobank.org/94E1EB0A-6E27-4B4B-825A-7B50384826AB>

Figs 14a–d, 21B

Material examined. Holotype: FRENCH GUIANA male; Roura; 8.4 km SSE; 200 m elevation; 4°40'0"N,

52°13'0"W; flight intercept trap; 29 May–10 Jun 1997; J. Ashe, R. Brooks leg. FG1AB97 182.

Paratypes: FRENCH GUIANA 1 female; same data as holotype 1 KNHM; 1 female; same data as holotype UIC; 1 male; Roura; 18.4 km SSE; 240 m elevation; 4°36'38"N, 52°13'25"W; flight intercept trap; 25–29 May 1997; J. Ashe, R. Brooks leg. KNHM FG1AB97 081; 1 female; same location but; 29 May–10 Jun 1997; J. Ashe, R. Brooks leg.; KNHM FG1AB97 180; 1 female; same data; UIC; 1 female; Saül; 7 km N, 3 km NW; Les Eaux Claires; Mt. La Fumée; 490 m elevation; 3°30'46"N, 53°13'19"W; flight intercept trap; 1–8 Jun 1997; J. Ashe, R. Brooks leg.; KNHM FG1AB97 162; 1 female; same location but; 7 km N; 0.5 km ESE; 300 m elevation; flight intercept trap; 4–8 Jun 1997; J. Ashe, R. Brooks leg.; KNHM FG1AB97 164; 1 female; Cayenne; 33.5 km S and 8.4 km NW of Hwy D5; 30 m elevation; 4°48'18"N, 52°28'41"W; flight intercept trap; 1–8 Jun 1997; J. Ashe, R. Brooks leg.; KNHM FG1AB97 171.

Diagnosis. According to the structure of the paramere and the position of the apical process at inner side of the aedeagal orifice, *S. guianensis* must be placed into the *S. struyvei* sub-group of the *S. laevis*-group. Amongst the Neotropical *Somoleptus* species, *S. guianensis* resembles *S. struyvei* Irmeler, 2022 of the same sub-group according to the total size and eye size. However, *S. struyvei* is slightly longer with 4.9 mm length and eyes are slightly larger with PS:E ratio 2.4, in *S. guianensis*, PS:E ratio is 2.6. Moreover, the parameres of the aedeagus are distinctly shorter and the processes at the inner side of the aedeagal orifice are more strongly sclerotised.

Description. Length: 4.5 mm; Colouration: completely black; legs light brown; antennae darker brown.

Head: 0.59 mm long, 0.51 mm wide; eyes slightly prominent; moderately large; PS:E ratio 2.6; postocular sides slightly convex; in posterior half, sides combined with posterior edge semi-circular; inter-antennal furrows indistinct; setiferous punctation moderately deep and sparse; on average, interstices between punctures at least twice as wide as diameter of punctures; surface without microsculpture; shiny; antennae with first antennomere elongate; distinctly longer than half-length of head; second and third antennomere conical; longer than wide; combined half as long as first antennomere; following antennomeres approximately twice as wide as long; anterior increasing in width. Pronotum: 0.72 mm long, 0.48 mm wide; widest in anterior third; sides approximately parallel; posterior margin obtuse; posterior margin slightly convex; setiferous punctation moderately deep and sparse; on average, interstices twice as wide as diameter of punctures; surface without microsculpture; shiny. Elytra: 0.68 mm long, 0.62 mm wide; humeral angles obtuse; sides slightly divergent posteriorly; posterior angles sub-rectangular; posterior margin straight; at suture with short incision; setiferous punctation finer than on pronotum, but as sparse; on average, interstices between punctures at least twice as wide as diameter of punctures. Abdomen with punctation fine and sparse; without microsculpture;

shiny; sternite VII and tergite VII of male with straight posterior margin; meso- and meta-tibia with 3 ctenidia each. Aedeagus oval; apically with obtuse prominence; dorsal plate covering nearly total central lobe; endophallus sack-like; weakly sclerotised; apical process with long setae; translocated to inner side of orifice; one third as long as central lobe; parameres extremely long; slender; as long as total length of central lobe; in apical third, slightly curved; in apical half, with several sensillae.

Etymology. The species name is derived from the Guiana region in north-east South America, where it was collected.

Geography. French Guiana.

Ecology. Lowland-forest floor up to 500 m elevation from May to June.

***Somoleptus luteicornis* sp. nov.**

<https://zoobank.org/9F985E1F-6421-4BD2-AF90-4412F6ED7724>

Figs 15a–d, 21C

Material examined. Holotype: COSTA RICA male; Puntarenas; Estac. Biol. Las Alturas; 2 km NE; 8°58'26"N, 82°50'4"W; 1720 m elevation; Berlese; leaf litter; 21 Jun 1998; R. Anderson leg.; KNHM CR1A98 106.

Paratypes: COSTA RICA 1 male; 1 female; San José; km 117 Pan-Am Hwy.; 19 km N San Isidro; 9°28'0"N, 83°42'20"W; 1800 m elevation; Berlese; forest litter; 25 Jun 1997; R. Anderson leg.; KNHM CR1A97 035A; 2 females; Alajuela; E.B. San Ramon; R.B. San Ramon; 27 km N and 8 km W San Ramon; 10°13'30"N, 84°35'30"W; 960 m elevation, Berlese; forest litter, 14 Jun 1997, leg. R. Anderson (CR1A97 014A) (KNHM); 1 female; Guanacaste; Patilla Biological Station; 10°59'22"N, 85°25'33"W; 610 m elevation; flight intercept trap; 13–15 Jun 2000; J. Ashe, R. Brooks, Z. Falin leg.; KNHM CR1ABF00 135.

Diagnosis. The species belongs to the *Somoleptus longicollis*-subgroup due to the structure of the aedeagus and the sternite VII of male with long central spine. According to the shape of the head and the proportion of the elytra, *S. luteicornis* resembles *S. punctulatus* Sharp, 1885, but the colouration is different. *Somoleptus luteicornis* is totally black, whereas the pronotum of *S. punctulatus* is lighter reddish-brown. It differs also by the yellow antennomeres IV to XI contrasting with the dark basal three antennomeres. In *S. punctulatus*, the antennomeres are totally yellow. Moreover, the apical cones at the orifice of the aedeagus are longer in *S. luteicornis* with C:A ratio of 0.3, whereas the ratio is 0.15 in *S. punctulatus*.

Description. Length: 3.89 mm; Colouration: completely black including legs and base of antennae; antennomeres IV to XI contrasting yellow from the three basal antennomeres.

Head: 0.67 mm long, 0.49 mm wide; eyes slightly prominent; moderately large; PS:E ratio 3.5; postocular sides nearly parallel; posterior angles sub-rectangular; setiferous punctation deep and dense; on average, interstices between punctures half as wide as diameter of punctures; small spot

at posterior head more sparsely punctate; surface without microsculpture; polished; antennae with first antennomere elongate; slightly longer than half-length of head; second and third antennomere longer than wide; conical; combined half as long as first antennomere; following antennomeres wider than long; anterior increasing in width. Pronotum: 0.75 mm long, 0.44 mm wide; widest at anterior third; conically narrowed to neck; posterior, sides slightly convergent to sub-rectangular posterior angles; posterior margin convex; setiferous punctation deep and dense; on average, interstices between punctures 0.8 times as wide as diameter of punctures; wide mid-line impunctate; surface without microsculpture; polished. Elytra: 0.78 mm long, 0.66 mm wide; humeral angles obtuse; sides nearly parallel; posterior angles sub-rectangular; posterior margin convex; retreated to suture; setiferous punctation deep and dense; irregular; close to suture nearly coriaceous; laterally, on average, interstices between punctures as wide as diameter of punctures; meso- and meta-tibia with 3 ctenidia each. Abdomen with setiferous punctation finer, but denser than on elytra; sternite VII of male with long triangularly prominent posterior margin; posterior margin of tergite VII of male convex. Aedeagus long oval; dorsal plate covering nearly total central lobe; endophallus with one torsion; central part of endophallus straight covered by distinct lobes; cones at apical orifice long; C:A ratio 0.38; paramere bilobed; outer transparent lobe reniform; inner elongate lobe slender with several setae at outer edge.

Etymology. The species name is a combination of the Latin words *luteus* meaning “yellow” and *cornu* meaning the antennae of insects and refers to the yellow antennomeres IV to XI.

Geography. Costa Rica.

Ecology. Floor of montane and cloud forest of 500 to 1500 m elevation in June.

***Somoleptus paramocola* sp. nov.**

<https://zoobank.org/CFE8C1AE-3C95-4449-8C63-D6E699F84AB9>

Figs 16a–d, 21D

Material examined. Holotype: COSTA RICA male; Cartago; Cerro Chirripo; Valle de los Conellos; 9°28'37"N, 83°29'23"W; 3600 m elevation; paramo shrub litter; 26 VI 1999; R. Anderson leg.; KNHM CR1A99 104D.

Paratypes: COSTA RICA 3 females; same data as holotype; KNHM; 1 male; same data; UIC; 1 male, San José/Cart.; km 71 Int-Am. Hwy; nr. Tres de Junio; 9°37'44"N, 83°50'13"W; 2900 m elevation; wet cloud forest litter; 23 VI 1999; R. Anderson leg.; KNHM CR1A99 101A.

Diagnosis. Together with *S. alajuelae* sp. nov., *S. paramocola* forms a new sub-group. The species resembles a group of other species with short elytra and extremely short eyes, *S. brunneus* Irmeler, 2022, *S. triangulus* Irmeler, 2022, *S. longiceps* Irmeler, 2022 and *S. ovatus* Irmeler, 2022 from the same high montane region of Central America. It can be differentiated from those species by the extremely short eyes with PS:E ratio 6.4 and the unique structure of the aedeagus.

Description. Length: 6.1 mm; Colouration: completely black; legs and antennae dark brown.

Head: 1.06 mm long, 0.91 mm wide; eyes not prominent; extremely short; PS:E ratio 6.4; postocular sides slightly divergent; posterior angles sub-rectangular; posterior edge straight; inter-antennal furrows short; not reaching front edge of eyes; setiferous punctation deep and dense; on average, interstices between punctures half as wide as diameter of punctures; surface without microsculpture; polished; antennae with first antennomere elongate; half as long as head; second and third antennomeres longer than wide; conical; combined half as long as first antennomere; following antennomeres wider than long; anterior increasing in width. Pronotum: 1.86 mm long, 0.78 mm wide; widest at anterior third; anteriorly, convexly narrowed to neck; posteriorly slightly convergent; posterior angles sub-rectangular; centre of posterior margin straight; setiferous punctation deep and moderately dense; on average, interstices between punctures as wide as diameter of punctures; a long wide impunctate mid-line denser; adjacent to mid-line, 17–18 punctures; surface without microsculpture; polished. Elytra: 0.78 mm long, 0.87 mm wide; humeral angles oblique; posteriorly, sides divergent; posterior angles sub-rectangular; posterior margin deeply retreated to suture; hind wings absent; setiferous punctation slightly finer than on pronotum, but as dense; on average, interstices between punctures 0.8 times as wide as diameter of punctures; surface without microsculpture; polished. Abdomen with setiferous punctation still finer than on elytra, but as dense; surface with transverse reticulate microsculpture; shiny; sternite and tergite VII of male with short central emargination; meso- and meta-tibia with one ctenidium each. Aedeagus nearly circular; dorsal plate covering nearly total central lobe; apical edge slightly prominent; straight; cones at apical orifice translocated laterally; combined forming a shape like cattle horns; parameres bilobed; inner lobe wide at base; abruptly narrowed in apical half to acute top; covered by several setae; two setae in apical half thicker than at base.

Etymology. The species name is a combination of the words *Paramo* that names the habitat in high Neotropical mountains and the Latin word *colo* meaning “dwelling” and refers to the habitat where the species was collected.

Geography. Central Costa Rica.

Ecology. Floor of high cloud forests and in Paramo between approximately 2900 and 3600 m elevation in June.

***Somoleptus puntarenae* sp. nov.**

<https://zoobank.org/D4EE2625-8C6C-43EA-98CD-5039603B9F25>

Figs 17a–d, 21E

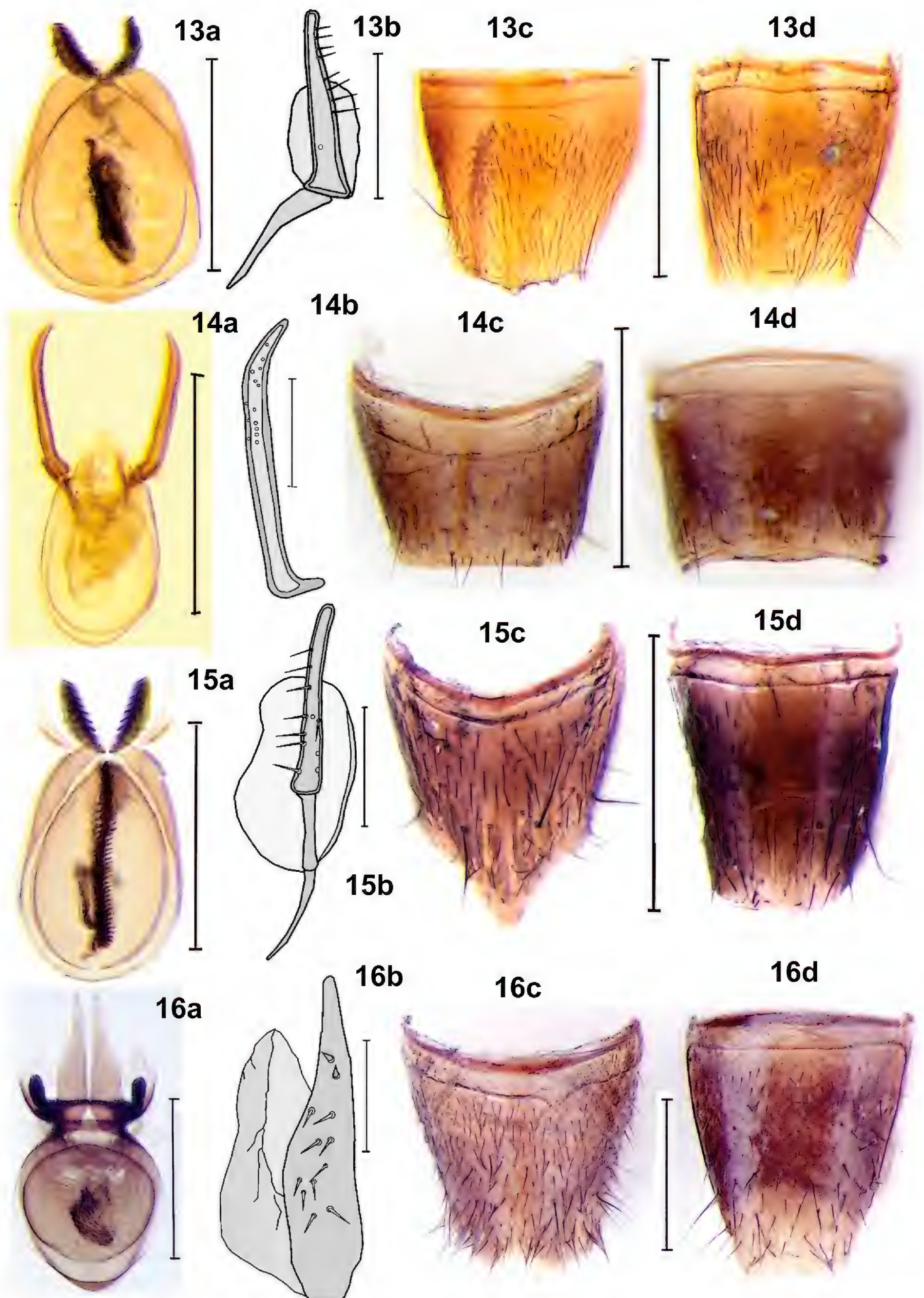
Material examined. Holotype: COSTA RICA male; Puntarenas-Guanacaste border; Cerro Amigos; 1780 m elevation; sifted leaf litter; 9 May 1989; J. Ashe, R. Brooks, R. Leschen leg.; Snow Entomol. Mus. Costa Rica Exped. KNHM #089.

Paratypes: COSTA RICA 1 male; same data as holotype; KNHM; 1 female; Puntarenas; Monteverde; Estacion Biologica Monteverde; 10°18'53"N, 84°47'49"W; 1750 m elevation; cloud forest litter; 15 VI 2001; R. Anderson leg.; KNHM CR1A01 114.

Diagnosis. The species' characters are typical for the *Somoleptus alticola*-subgroup. The parameres are bilobed and the posterior margin of sternite VII of the male is straight. Regarding the overall habitus of the species, it resembles *S. loretensis* Irmeler, 2022 in total size, proportion of elytra and head and size of eyes. Compared to *S. loretensis*, the pronotum is more parallel. Moreover, the structure of the aedeagus is unique amongst the Neotropical *Somoleptus* species with its elongate apical cones forming a triangle.

Description. Length: 5.7 mm; Colouration: completely black; legs and antennae lighter brown.

Head: 0.98 mm long, 0.77 mm wide; eyes not prominent; moderately long; PS:E ratio 4.0; posterior sides slightly divergent; posterior angles widely rounded; combined with posterior margin semi-circular; inter-antennal furrows weak, but long; reaching mid-length of eyes; setiferous punctation moderately deep and dense; on average, interstices as wide as diameter of punctures; along mid-line sparser; surface without microsculpture; polished; antennae with first antennomere elongate; half as long as head-length; second and third antennomere longer than wide; conical; following antennomeres, wider than long; anterior increasing in width. Pronotum: 1.15 mm long, 0.68 mm wide; widest at anterior third; anteriorly, conically narrowed to neck; posteriorly parallel; posterior angles sub-rectangular; posterior margin slightly convex; setiferous punctation moderately deep and moderately dense; on average, interstices between punctures as wide as diameter of punctures; irregular line of punctures adjacent to impunctate mid-line with 23–24 punctures; surface without microsculpture; polished. Elytra: 0.86 mm long, 0.79 mm wide; humeral angles obtuse; sides posteriorly nearly parallel; posterior angles sub-rectangular; posterior margin retreated to suture; setiferous punctation deeper and denser than on head and pronotum; on average, interstices between punctures half as wide as diameter of punctures; close to suture, punctation partly coriaceous; surface without microsculpture; shiny. Abdomen with setiferous punctation finer and denser than on fore-body; sternite VII of male conically narrowed to short straight posterior margin; tergite VII of male also conically narrowed; posterior margin broadly prominent; meso- and metatibia with several striae, but without distinct ctenidia. Aedeagus long oval; dorsal plate circular; endophallus thick; strongly sclerotised; covered by thick spines; with longitudinal torsion; adjacent to circular apical orifice, two elongate cones; with smooth long shaft and short rough top; forming an elongate triangle; parameres bilobed; covering triangle; thick inner lobe centrally with crease in longitudinal direction; at apex with several teeth; soft outer lobe thin; with fold in opposite direction to inner lobe; inner lobe on back side, outer lobe on front side of apical lobes.



Figures 13–16. 13. *Somoleptus densiceps*; 14. *S. guianensis*; 15. *S. luteicornis*; 16. *S. paramocola*. **a.** Aedeagus; **b.** Paramere; **c.** Sternite VII; **d.** Tergite VII. Scale bars: 0.5 mm (**a, c, d**); 0.1 mm (**b**).

Etymology. The species name is derived from the name of the Province Puntarenas in Costa Rica, where it was sampled.

Geography. Northern Costa Rica.

Ecology. Floor of cloud forests at 1700 m elevation.

***Somoleptus umicola* sp. nov.**

<https://zoobank.org/CF53A865-0698-413F-B9F5-F47D51DFFCAC>
Figs 18a–d, 21F

Material examined. Holotype: COSTA RICA male; Puntarenas Prov.; Altamira Biol. Stat.; 09°01'76"N, 83°00'49"W; 1510–1600 m elevation; pyrethrum fogging moss-covered clay bank; 7 VI 2004; J. Ashe, Z. Falin, I. Hinojosa leg.; KNHM CR1AFH04 151.

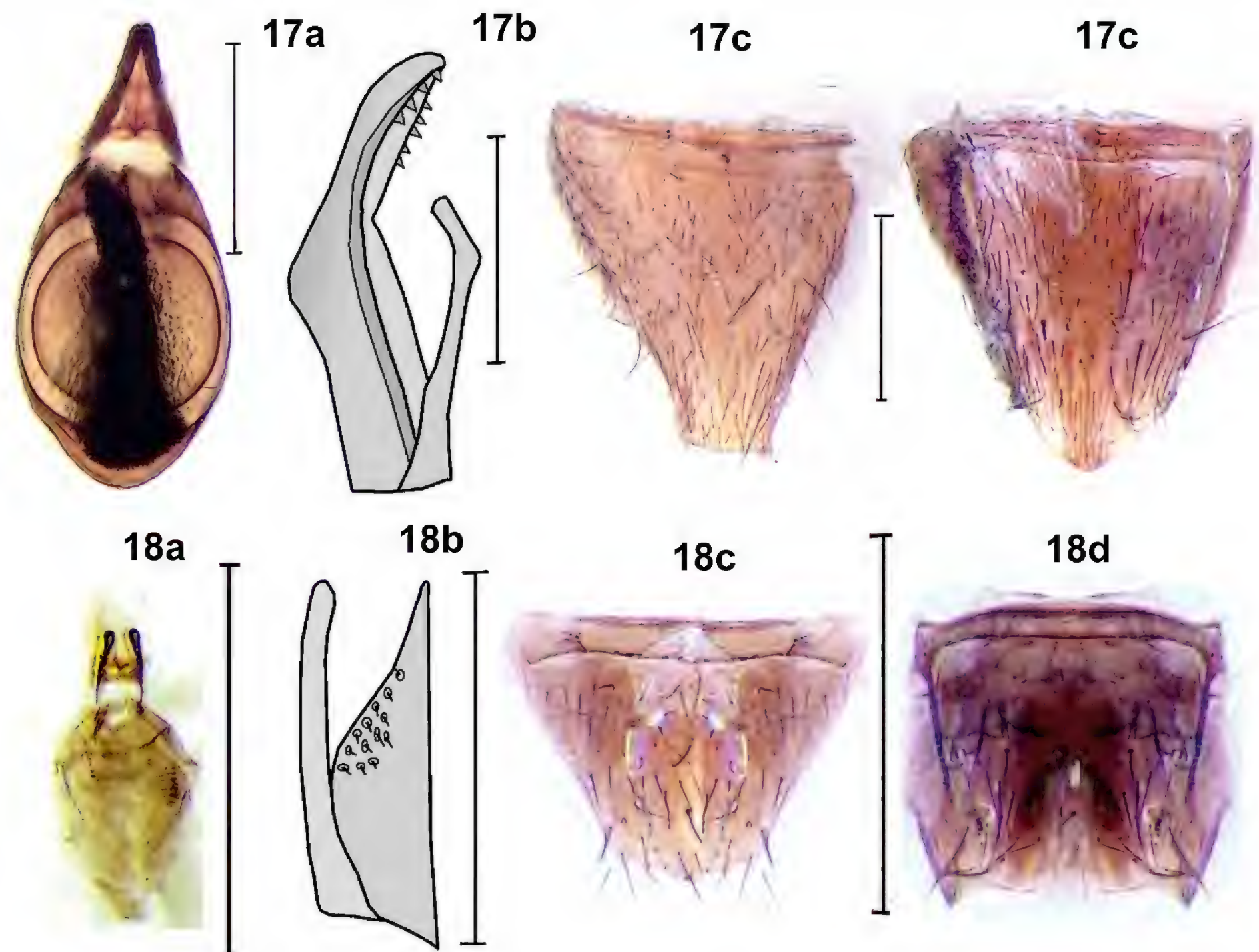
Paratype: COSTA RICA 1 female; same data as holotype KNHM.

Diagnosis. The taxonomic position of the species is unclear. It has a large dorsal plate of the central lobe and a triangular prominence at posterior margin of sternite VII of male. These characters fit to the *S. longicollis*-subgroup. On the other hand, the endophallus is not sclerotised similar to the species of the *S. admirabilis*-subgroup. The cones at the apex of the central

lobe resemble those of several species of the *S. alticola*-subgroup. According to the small size, shape of head and the proportion of the elytra, *Somoleptus umicola* best resembles to *Somoleptus obsoletus* Sharp, 1885. *Somoleptus umicola* is still smaller, such as *S. parvulus* Sharp, 1885. In contrast to *S. parvulus* with light brown pronotum and sclerotised endophallus, *S. umicola* is totally black and the endophallus is transparent.

Description. Length: 3.28 mm; Colouration: completely black; legs and antennae lighter brown.

Head: 0.62 mm long, 0.49 mm wide; eyes slightly prominent; moderately large; PS:E ratio 3.1; sides nearly parallel; posterior angles sub-rectangular; posterior sides combined with posterior edge semi-circular; inter-antennal furrows distinct and long; reaching to mid-length of eyes; setiferous punctation deep and dense; on average, interstices between punctures shorter than diameter of punctures; on anterior head denser than on posterior head; surface without microsculpture; shiny; antennae with first antennomere elongate; half as long as head-length; second and third antennomere conical; longer than wide; combined half as long as first antennomere; following antennomeres wider than long; anterior increasing in width. Pronotum: 0.71 mm long, 0.44 mm wide; widest at anterior third; conically narrowed to neck; posterior, sides nearly parallel; posterior



Figures 17, 18. 17. *Somoleptus punctarenae*; 18. *S. umicola*. a. Aedeagus; b. Paramere; c. Sternite VII; d. Tergite VII. Scale bars: 0.5 mm (a, c, d); 0.1 mm (b).

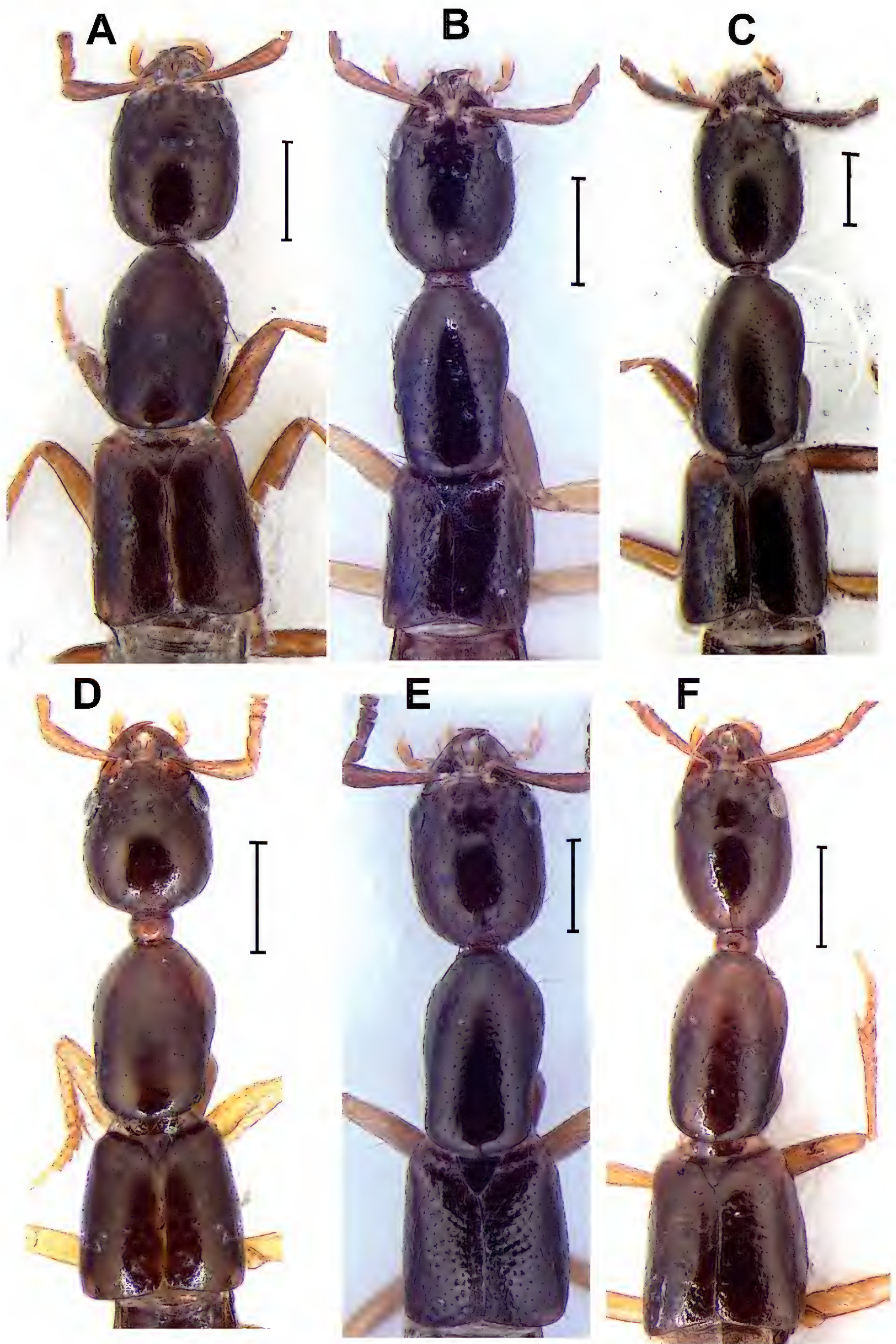


Figure 19. A. Fore-body of *Lithocharodes andersoni*; B. *L. dubia*; C. *L. esmeraldae*; D. *L. falini*; E. *L. hansonii*; F. *L. hibbsi*. Scale bars: 0.5 mm.

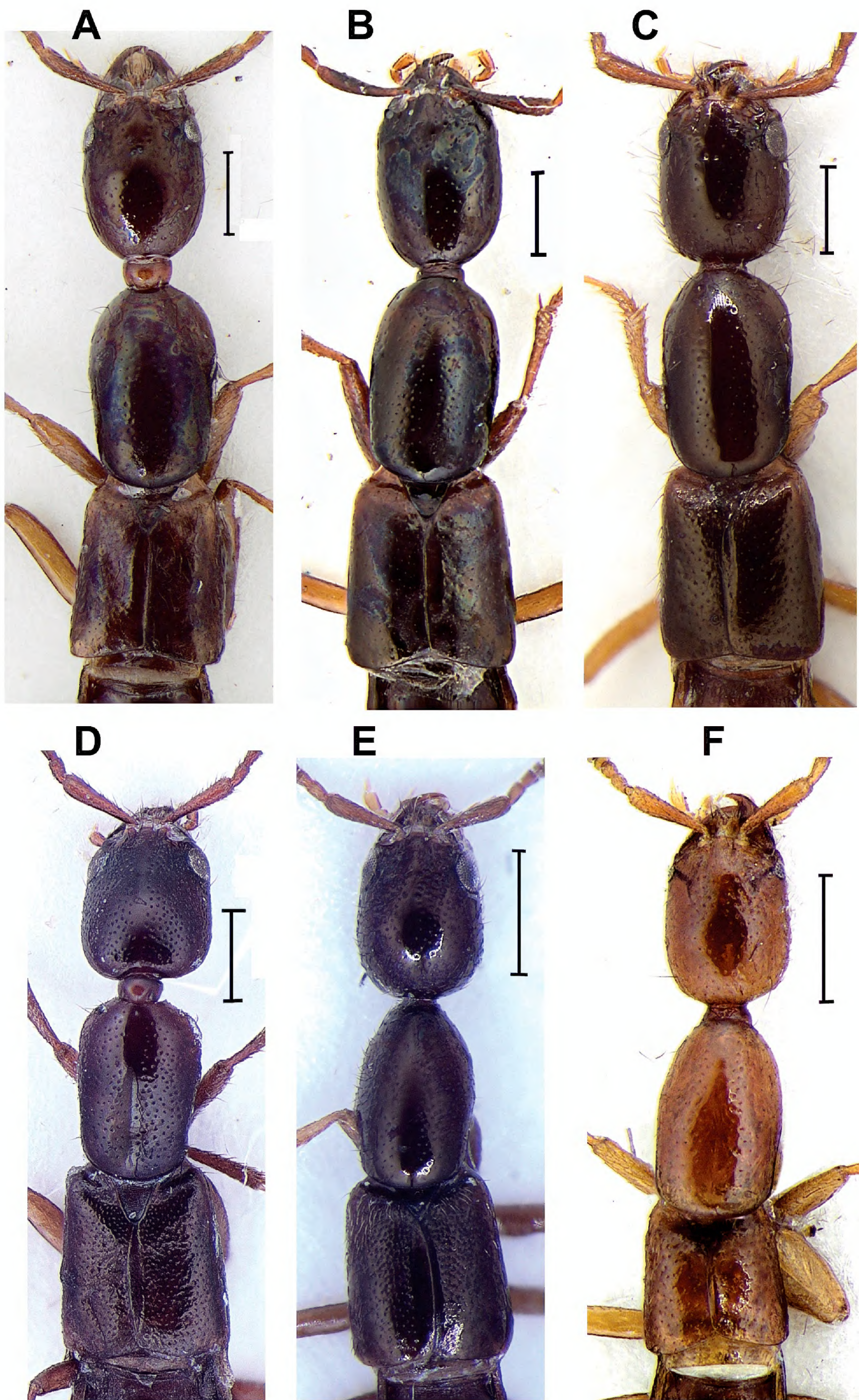


Figure 20. A. Fore-body of *Litghocharodes lituratus*; B. *L. montanus*; C. *L. parallelus*; D. *L. zamorae*; E. *Somoleptus alajuelae*; F. *S. curtioculatus*. Scale bars: 0.5 mm.

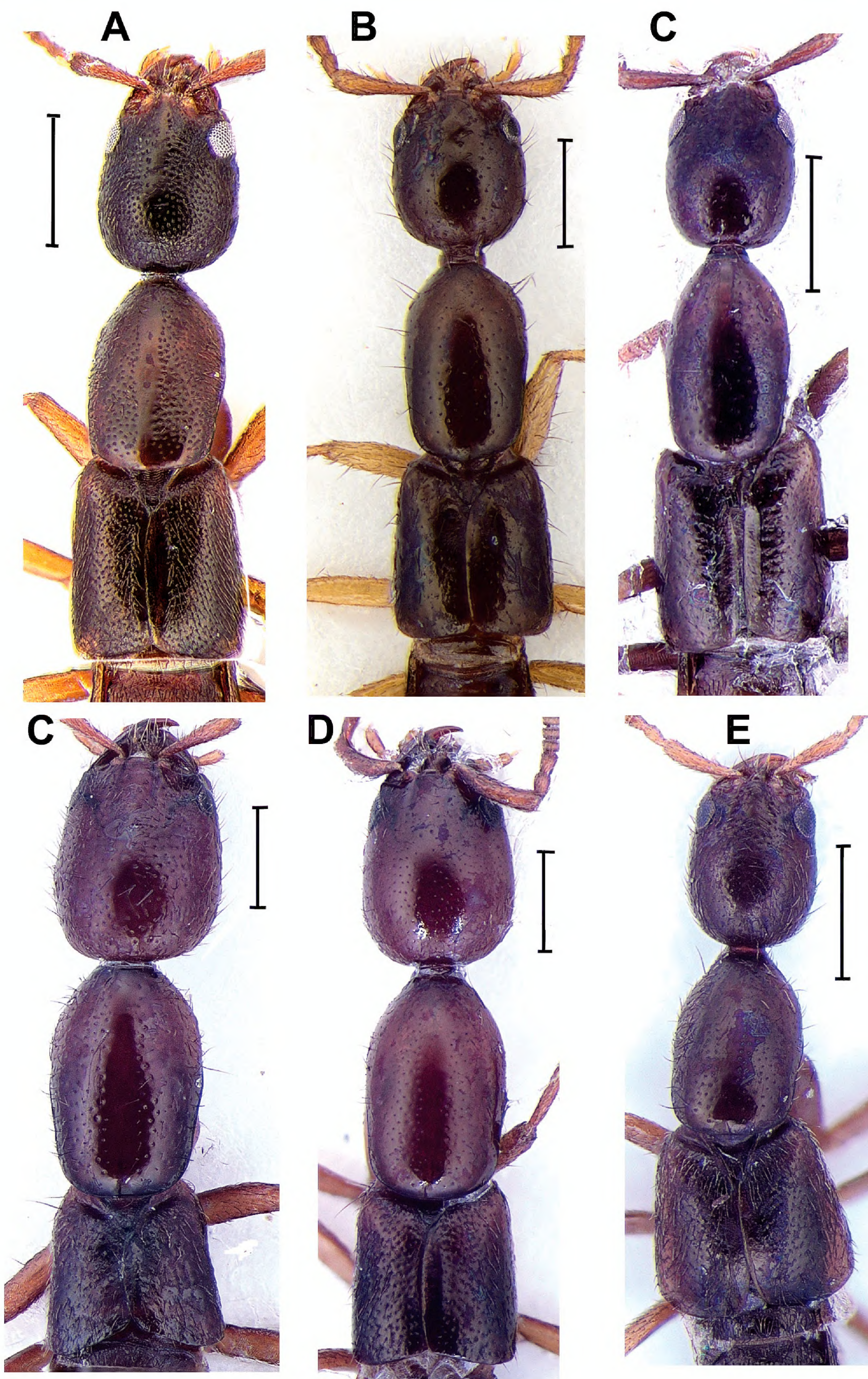


Figure 21. A. Fore-body of *Somoleptus densiceps*; B. *S. guianensis*; C. *S. luteicornis*; D. *S. paramocola*; E. *S. puntarenae*; F. *S. umicola*. Scale bars: 0.5 mm.

angles sub-rectangular; posterior margin slightly convex; setiferous punctation moderately deep and dense; on average, interstices as wide as diameter of punctures; small mid-line impunctate; adjacent to mid-line with irregular line of 22–24 punctures; surface without microsculpture; polished. Elytra: 0.69 mm long, 0.65 mm wide; humeral angles obtuse; sides nearly parallel; posterior margin convex; retreated to suture; setiferous punctation deep and dense; on average, interstices between punctures shorter than diameter of punctures; surface without microsculpture; polished. Abdomen with finer punctation than on elytra, but as dense; surface without microsculpture; polished; meso-tibia with three, meta-tibia with two ctenidia. Aedeagus egg-shaped; more acute at base and more oval at apex; dorsal plate nearly totally covering central lobe; endophallus transparent; apical orifice prominent; laterad to upper edge of orifice with two elongate slender cones; parameres bilobed; projecting apical cones; inner lobe broad at base; in middle, abruptly narrowed to acute apex; at outer edge, centrad with several setae; outer lobe slender; as long as inner lobe.

Etymology. The species name is a combination of the Latin words *umidus* meaning “wet” and *colo* meaning “dwelling” and refers to the wet habitat, where it was found.

Geography. Northern Costa Rica.

Ecology. Under moss of river bank.

New records

Lithocharodes bicolor (Sharp, 1885)

Material. MEXICO 1 male; Chiapas; 8 km N Ixtapa; sifted leaf litter near stream; 1040 m elevation; 11 June 1991; J.S. Ashe leg.; KNHM #93.

Lithocharodes curtippennis Irmeler, 2021

Material. COSTA RICA 1 male; San José; Cerros de Escazu; 2 km S San Antonio; 9°53'9"N, 84°9'0"W; 1650 m elevation; Berlese; forest litter; 13 June 1997; R. Anderson leg.; KNHM #CR1A97013H.

Lithocharodes puncticeps Sharp, 1885

Material. MEXICO 1 male; Nuevo Leon; 37 km SW Linares; 4.8 km S: on Bosque Escuela; 1545 m elevation; 17–24 March June 1997; pitfall trap; R. Brooks, R. Leschen leg.; KNHM; 1 female, Puebla; 7.6 km E Vincente Guerrero; Santa Maria del Monte V. G.; 2420 m elevation; forest litter; 16 July 1992; J.S. Ashe leg.; KNHM #74.

Lithocharodes somoleptoides Irmeler, 2021

Material. MEXICO 1 male; Chiapas; Yerbabuena Reserve; 2.1 km NW Pueblo Nuevo Solistahuacan; 2070 m

elevation; Liquid-amber forest litter; 23 September 1992; R. Anderson leg.; KNHM #92-114; 1 male; Chiapas; Cerro El Calvario; ~ 14 km NE Coapilla; 17°10.958'N, 93°07.091'W; 2150 m elevation; sifted mixed cloud forest litter (steep); 3 VII 2007; R. Anderson V; KNHM #LLAMA07 RSA008; 1 female; Puebla; 7.6 km E Vincente; Guerrero (Santa Maria del Monte V.G.); forest litter; 2420 m elevation; 16 July 1992; H.S. Ashe leg.; KNHM #74.

Somoleptus humicola Irmeler, 2022

Material. MEXICO 1 male; Oaxaca; 32 km SW Valle Nacional; km 85; trans./cloud forest leaf litter; 1650 m elevation; Berlese; 26 July 1992; R. S. Anderson leg.; KNHM 92-030.

Somoleptus longicollis (LeConte, 1863)

Material. COSTA RICA 1 male; Puntarenas; Monte Verde; 1400 m elevation; flight intercept trap; 14 May 1989; J. Ashe, R. Brooks, R. Leschen; Snow Entomol. Mus. Costa Rica Exped.; KNHM; 1 female; Heredia; Sto. Domingo del Heredia; INBio Cafetal; 1100 m elevation; flight intercept trap; 25–28 June 1997; S & J. Peck leg.; KNHM #CR1P97 027.

Somoleptus ashei Irmeler, 2022

Material. MEXICO 1 male; Chiapas; Mpio. El Porvenir; El Porvenir; 15°28'05"N, 92°16'70"W; 2950 m elevation; oak/pine/oyaml forest litter; 27.VII.2005; R. Anderson leg.; KNHM #MEX1A05-011; 1 male; Oaxaca; 32 km SW Valle National km 85; 1650 m elevation; trans./cloud forest leaf litter; Berlese; 26 July 1992; R. Anderson leg.; KNHM #92-030.

Somoleptus obscurus Sharp, 1885

Material. MEXICO 1 male; Hidalgo; 13.1 km NE Jacala; 1760 m elevation; montane oak forest; Berlese; 9 June 1987; R. Anderson leg.; KNHM; 1 female; Guerrero; 78.5 km N jct. Rte. 200 on Rte. 134 to Ciudad Altamirano; 1770 m elevation; leaf litter at cliff base and in ravine; 23 July 1992; J.S. Ashe, H. Frania leg.; KNHM #144.

Somoleptus ovatus Irmeler, 2022

Material. COSTA RICA 1 female; Cartago; P.N. Tapanti; 9°45'0"N, 83°49'0"W; 1500 m elevation; Berlese; forest litter; 4 June 1997; R. Anderson leg.; KNHM #CR1A97 001H.

Discussion

Amongst the material of the Kansas Natural History Museum, Lawrence identified, originally as *Somoleptus* specimens, ten new species of *Lithocharodes* and eight new species of *Somoleptus* were also found. Overall, the total number of species in the genus *Lithocharodes* increased to 54 and in the genus *Somoleptus* to 53. In accordance with the findings of Irmeler (2021), only three species of ten new *Lithocharodes* species occur in the Central American region, whereas seven were only found in South American countries. In contrast, seven of the eight new *Somoleptus* species were recorded only from Central America. This supports the findings of Irmeler (2021, 2022) that the distribution of *Lithocharodes* concentrates in South America and *Somoleptus* to Central America.

The *Somoleptus* species described here originate mostly from high mountain zones as was already found for many other species of the genus. Several of them, such as *S. paramocola* or *S. curtioculatus*, live at elevations between 2500 m and 3600 m. In contrast, *Lithocharodes* species were rarely found at elevations higher than 1000 m.

As already stated by Irmeler (2021), the shape of the pronotum that was used for differentiation of the specimens is unsuitable to differentiate the two genera as there are many transitional species in *Lithocharodes* in existence that have no widened pronotum in the anterior third. This is particularly true for the newly-described species of *Lithocharodes* here. Most of the species are characterised by an approximately parallel pronotum. Thus, a study of the aedeagus is needed to separate the two genera. Even the aedeagal characters described by Irmeler (2021) are vague in few species. This is true, for example, for *Lithocharodes dubia* sp. nov. In this species, the apical orifice of the aedeagus has a sclerotised inner edge that resembles, in some aspects, the row of spines in several *Somoleptus* species. The same is true for *Lithocharodes hansonii*. This species has a similar sclerotised edge at the orifice of the aedeagus, but resembles *Lithocharodes obscura* Irmeler, 2021 in the position of the dorsal plate without such a sclerotised structure of the aedeagal orifice. This sclerotised edge of the aedeagal orifice may be considered as transitional between *Lithocharodes* and *Somoleptus*. It may also show that both genera are still closely related and in an ongoing evolutionary process that is not yet finished to lead in a clear generic separation. The vague separation using the shape of the pronotum evidently supports this hypothesis. The geographic separation of the two genera in their main distributions, namely *Lithocharodes* in South America and *Somoleptus* in Central America, may indicate that *Somoleptus* originated from South American *Lithocharodes* species and may be a very young genus with fast evolution after the geological closure between South- and Central America approximately 4 million years ago. This hypothesis

would also explain the higher variability of the aedeagus in the *Somoleptus* of northern South America species and the more uniform structure of the aedeagus in Central America. However, this problem can only be solved by a genetic study of the species of both genera that will also clear the question if the species are separated really in two distinct genera or can be still considered as one genus with high variability.

Conclusions

The present study completes further studies on the Neotropical genera *Lithocharodes* and *Somoleptus* using species, which were difficult to assign to one of the two genera. The study shows that both genera are still very closely related and a separation is difficult in some species. It supports the hypotheses that the species of the genus *Lithocharodes* more frequently inhabit lowland forests up to montane forests, whereas species of the genus *Somoleptus* inhabit higher elevations and avoid lowland habitats.

Acknowledgements

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References

- Erichson W (1839) Genera et species Staphylinorum Insectorum Coleopterorum familiae. Berlin: Morin, 954 pp. <https://doi.org/10.5962/bhl.title.59644>
- Hadley A (2006) Combine Z5.3. Public Domain Software.
- Irmeler U (2021) The Neotropical species of the genus *Lithocharodes* SHARP, 1876 (Coleoptera: Staphylinidae: Staphylininae: Xantholinini). Contributions to Entomology 71: 29–86. <https://doi.org/10.21248/contrib.entomol.71.1.029-085>
- Irmeler U (2022) The Neotropical species of the genus *Somoleptus* Sharp, 1885 (Coleoptera: Staphylininae: Xantholinini). Contributions to Entomology 72: 123–178. <https://doi.org/10.3897/contrib.entomol.72.e87211>
- LeConte J (1863) New species of North American Coleoptera. Smithsonian Miscellaneous Collections 6: 1–92. <https://doi.org/10.5962/bhl.title.51303>
- Sharp D (1876) Contribution to an insect fauna of the Amazon Valley. Coleoptera, Staphylinidae. Transactions of the Entomological Society of London 1: 27–424. <https://doi.org/10.1111/j.1365-2311.1876.tb01123.x>
- Sharp D (1885) Biologia Centrali-Americana. Insecta, Coleoptera. Staphylinidae. London: Taylor & Francis, 145–824.